SUPPLEMENTARY EUROPEAN SEARCH REPORT

Application Number
EP 04 75 7087

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 1 058 255 A (SONY CORP [JP]) 6 December 2000 (2000-12-06) * paragraphs [0032] - [0043], [0045] - [0051], [0118], [0128], [0136]; figures 2,3 *	1-13	INV. G06F11/30 G06F17/30
X	EP 1 154 404 A (SONY CORP [JP]) 14 November 2001 (2001-11-14) * paragraphs [0024] - [0026], [0040] - [0051], [0061] - [0078], [0386]; figures 1-4 *	1-13	
A	US 5 638 444 A (CHOU WAYNE W [US] ET AL) 10 June 1997 (1997-06-10) * column 1, line 5 - line 7 * * column 3, line 3 - line 13 *	1-13	
A	WO 00/68858 A (MANKOFF JEFFREY W [US]) 16 November 2000 (2000-11-16) * the whole document *	1-13	

TECHNICAL FIELDS SEARCHED (IPC)

G06F

The supplementary search report has been based on the last set of claims valid and available at the start of the search.

Place of search	Date of completion of the search	Examiner
The Hague	20 March 2009	Alecu, Mihail

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 04 75 7087

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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20-03-2009

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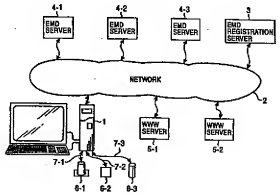
(54) Information processing apparatus, information processing method, and program storage medium

(57) When a content is moved from a flash memory into a content database, a usage rule management program updates a variable seq-1, stored in a *0th* defective block of a media defect list stored in the flash memory, to a new value seq-2. The usage rule management program calculates an MAC value (hash value) on the basis of the content stored in the data portion of the flash memory, an encrypted encryption key, and important information including the variable seq#. The usage rule management program then compares the calculated value with an MAC value stored in the header portion of the flash memory. If these two values are not equal, the usage rule management program disables reproduction of the content thereby preventing the content from being copied in an unauthorized manner.

FIG. 1



EP 1 058 255 A2

Description

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] The present invention relates to an information processing apparatus, an information processing method, and a program storage medium, and more particularly, to an information processing apparatus, an information processing method, and a program storage medium, which make it possible to prevent data from being tempered or copied in an unauthorized manner.

2. Description of the Related Art

[0002] Digital technology has become very popular. As a result, various types of content data such as music data and image data are digitally recorded and reproduced onto or from a storage medium. This makes it possible to copy content data many times without resulting in degradation in image or sound quality.

[0003] However, the advance in the digital technology has created the following problems.

1. For example, digital music data can be copied from a compact disk (CD) into a hard disk of a personal computer. In this case, the music data recorded on the CD is directly recorded on the hard disk or recorded after being compressed. This makes it possible to distribute a great number of copies via a network such as the Internet.
2. There is no limitation in the maximum number of times that digital music data is copied from a CD into a hard disk of a personal computer. This makes it possible to distribute a great number of copies. .
3. When digital music data recorded on a hard disk of a personal computer is copied into an external device such as a portable device, the original music data remains on the hard disk after making a copy. This makes it possible to distribute a great number of copies.
4. The problem described in (3) may be avoided if a personal computer is controlled by software such that data such as digital music data stored on a hard disk is deleted after the data has been transferred to an external device (that is, music data is moved). However, even in this case, the original data can be left on the hard disk by making a backup copy of the data stored on the hard disk onto another storage medium before moving the data and restoring the backup data onto the hard disk
5. When digital music data recorded on a hard disk of a computer is copied into an external device such as a portable device, the personal computer does not check the authorization of the external device. This makes it possible to copy digital music data into an unauthorized device.
6. When digital music data is copied from an external device such as a portable device into a personal computer, the external device does not check the authorization of software which controls the personal computer. This makes it possible to copy digital music data into a personal computer using unauthorized software.
7. In some cases, when music data is reproduced by a personal computer from a CD, ISRC (International Standard Recording Code) included in the music data is used by the personal computer to determine whether a plurality of contents are the same or not. However, some CDs do not include ISRC data. In this case, it is impossible to determine whether a plurality of contents are the same or not.
8. The various functions described above are realized on a personal computer by means of software. Therefore, if the software is tempered, it may become possible to operate the computer in a manner different from that intended by a system designer.

[0004] In view of the above, an object of the present invention is to provide a technique for preventing content data stored on a hard disk from being tempered or copied in an unauthorized manner.

SUMMARY OF THE INVENTION

[0005] In accordance with an aspect of the present invention, there is provided an information processing apparatus comprising: storage means for storing content data encrypted with an encryption key; holding means for holding management information associated with the content data stored in the storage means; calculation means for performing a predetermined calculation on the basis of the encryption key and calculation information included in the management information, the calculation information including update information which is updated with predetermined timing; memory means for storing the result of the calculation performed by the calculation means; and control means for comparing the result of the calculation performed by the calculation means with a previous calculation result stored in the memory means and controlling use of the content data stored in the storage means in accordance with the result of the

comparison. Preferably, the calculation means performs the calculation by applying a hash function to the calculation information and the encryption key.

[0006] Preferably, the content data is music data, the calculation information includes identification information identifying the music data, and the holding means holds the update information in an area which is not allowed to be read or written for a general purpose.

[0007] According to another aspect of the present invention, there is provided an information processing method comprising the steps of: storing content data encrypted with an encryption key; holding management information associated with the content data stored in the storage step; performing a predetermined calculation on the basis of the encryption key and calculation information included in the management information, the calculation information including update information which is updated with predetermined timing; memory means for memorizing the result of the calculation performed in the calculation step; and comparing the result of the calculation performed in the calculation step with a previous calculation result memorized in the memorizing step and controlling use of the content data stored in the storage step in accordance with the result of the comparison.

[0008] According to still another aspect of the present invention, there is provided a program storage medium on which a program is stored, the program including the steps of: storing content data encrypted with an encryption key; holding management information associated with the content data stored in the storage step; performing a predetermined calculation on the basis of the encryption key and calculation information included in the management information, the calculation information including update information which is updated with predetermined timing; memory means for memorizing the result of the calculation performed in the calculation step; and comparing the result of the calculation performed in the calculation step with a previous calculation result memorized in the memorizing step and controlling use of the content data stored in the storage step in accordance with the result of the comparison.

[0009] As described above, in the information processing apparatus, the information method, and the program stored in the program storage medium, according to the present invention, the result of a calculation performed on the basis of calculation information and an encryption key is compared with a previous calculation result, and use of stored content data is controlled in accordance with the comparison result

BRIEF DESCRIPTION OF THE DRAWINGS

[0010]

Fig. 1 is a schematic diagram illustrating an embodiment of a content data management system according to the present invention;

Fig. 2 is a schematic diagram illustrating a configuration of a personal computer shown in Fig. 1;

Fig. 3 is a schematic diagram illustrating a configuration of a portable device shown in Fig. 1;

Fig. 4 is a block diagram illustrating functions of the personal computer shown in Fig. 1;

Fig. 5 is a schematic diagram illustrating a content file;

Fig. 6 is a flow chart illustrating the process of outputting a content from a portable device shown in Fig. 1 to the personal computer shown in Fig. 1;

Fig. 7 is a schematic diagram illustrating the operation of the flash memory shown in Fig. 3, performed during the process shown in Fig. 6;

Fig. 8 is a schematic diagram illustrating a media defect list;

Fig. 9 is a flow chart illustrating the process of moving data from a portable device to the HDD shown in Fig. 2; and

Fig. 10 is a schematic diagram illustrating the operation of the flash memory, performed during the process shown in Fig. 9.

DESCRIPTION OF THE PREFERRED EMBODIMENT

[0011] Fig. 1 is a schematic diagram illustrating an embodiment of a content data management system according to the present invention. A personal computer 1 is connected to a network 2 such as a local area network or the Internet. If the personal computer 1 receives music data (hereinafter also represented as a content) from any of EMD (electrical music distribution) servers 4-1 to 4-3 or form a CD (compact disc) which will be described later, the personal computer 1 stores the received data after compressing and encrypting it according to a predetermined compression method (such as ATRAC-3 (trade mark)) and an encryption method such as DES (Data Encryption Standard).

[0012] The personal computer 1 also stores data representing rules of using the content stored in the encrypted fashion.

[0013] The usage rule data represents, for example, the number of portable devices (PDs) allowed to simultaneously use the content corresponding to that usage rule data (that is, the number of PDs allowed to be checked out). The personal computer 1 can reproduce the content as long as the number of checked-out PDs is equal to or less than the

number specified by the usage rule data.

[0014] The usage rule data also indicates that the content is allowed to be copied. That is, even when the content has been copied to any of portable devices 6-1 to 6-3, the personal computer 1 can reproduce the content stored thereon. The maximum number of times that the content is allowed to be copied to portable devices 6-1 to 6-3 may be specified. In this case, the content cannot be copied a greater number of times than the specified number of times.

[0015] The usage rule data may also indicate that the content is allowed to be moved into another personal computer. If the content is moved into any of portable devices 6-1 to 6-3, the content stored in the personal computer 1 becomes unusable (the content is deleted or the usage rule data is changed so that use of the content is disabled).

[0016] The details of the usage rule data will be described later.

[0017] When a content stored in the encrypted fashion is copied together with associated data (representing the content title and the reproduction conditions) from the personal computer 1 into the portable device 6-1/via a USB (universal serial bus) 7-1, the usage rule data associated with the copied content is updated (that is, checked out). More specifically, when a content is checked out, the usage rule data stored in the personal computer 1 in terms of the maximum allowable checkout number corresponding to the checked-out content is decremented by 1. If the maximum allowable checkout number is equal to 0, the corresponding content is no longer allowed to be checked out.

[0018] A content stored in the encrypted form in the personal computer 1 may also be copied together with associated data into the portable device 6-2 via the USB cable 7-2. In this case, the usage rule data associated with the content copied to the portable device 6-2 is updated. Similarly, when a content stored in the encrypted form in the personal computer 1 is copied together with associated data into the portable device 6-3 via the USB cable 7-3, the usage rule data associated with the content copied to the portable device 6-3 is updated.

[0019] The personal computer 1 may send a command via the USB cable 7-1 to the portable device 6-1 to delete (or disable use of) a content which has been checked out. In this case, the usage rule data associated with the deleted content is updated (that is, checked in). More specifically, when a content is checked in, the usage rule stored in the personal computer 1 in terms of the maximum allowable checkout number corresponding to the checked-in content is incremented by 1.

[0020] The personal computer 1 may also send a command via the USB cable 7-2 to the portable device 6-2 to delete (or disable use of) a content which has been checked out. In this case, the usage rule data associated with the deleted content is updated. Similarly, the personal computer 1 may also send a command via the USB cable 7-3 to the portable device 6-3 to delete (or disable use of) a content which has been checked out, and the usage rule data associated with the deleted content may be updated.

[0021] In the case where the portable device 6-1 has checked out a content from another personal computer (not shown in Fig. 1) other than the personal computer 1, that content cannot be checked in into the personal computer 1. Similarly, in the case where the portable device 6-2 has checked out a content from another personal computer other than the personal computer 1, that content cannot be checked in into the personal computer 1. Furthermore, in the case where the portable device 6-3 has checked out a content from another personal computer other than the personal computer 1, that content cannot be checked in into the personal computer 1.

[0022] When the personal computer 1 starts to acquire a content from one of EMD servers 4-1 to 4-3, the personal computer 1 requests an EMD registration server 3 to transmit an authentication key required for mutual authentication between the personal computer 1 and one of the EMD servers 4-1 to 4-3. In response to the request from the personal computer 1, the EMD registration server 3 transmits the authentication key to the personal computer 1 via the network 2. The EMD registration server 3 also transmits to the personal computer 1 a program required for connection with one of EMD servers 4-1 to 4-3.

[0023] If the EMD server 4-1 receives a request from the personal computer 1, the EMD server 4-1 supplies a requested content together with associated data (representing, for example, its title and limitations in terms of reproduction) to the personal computer 1 via the network 2. Similarly, if the END server 4-2 receives a request from the personal computer 1, the EMD server 4-2 supplies a requested content together with associated data to the personal computer 1 via the network 2. Furthermore, if the EMD server 4-3 receives a request from the personal computer 1, the EMD server 4-3 supplies a requested content together with associated data to the personal computer 1 via the network 2.

[0024] The contents supplied from the respective EMD servers 4-1 to 4-3 are compressed in accordance with the same or different compression methods. The contents supplied from the respective EMD servers 4-1 to 4-3 are encrypted in accordance with the same or different encryption methods.

[0025] If a WWW (World Wide Ueb) server 5-1 receives a request from the personal computer 1, the WWW server 5-1 transmits data representing information (as to for example the album title and the manufacturer of the CD)associated with the CD a content of which is read and data representing information (as to for example the content title and the composer name) associated with the content to the personal computer 1 via the network 2. If a WWW (World Wide Ueb) server 5-2 receives a request from the personal computer 1, the WWW server 5-2 transmits data representing information associated with the CD a content of which is read and data representing information associated with the content to the personal computer 1 via the network 2.

[0026] The portable device 6-1 stores a content supplied from the personal computer 1 (that is, a checked-out content) together with associated data (representing, for example, the title and/or limitations in terms of reproduction thereof). In accordance with the data associated with the content, the portable device 6-1 reproduces the content stored therein and outputs it to a headphone or the like (not shown).

[0027] For example, if a content is attempted to be reproduced a greater number of times than the maximum allowable number of times specified by the data associated with the content, the portable device 6-1 terminates the reproduction of that content. If a content is attempted to be reproduced after the expiration date specified by the data associated with the content, the portable device 6-1 does not reproduce that content.

[0028] A user may remove the portable device 6-1, in which the content is stored, from the personal computer 1, and may carry it to reproduce the stored content and listen to music corresponding to the content via a headphone or the like.

[0029] Similarly, the portable device 6-2 stores a content supplied from the personal computer 1 together with associated data. In accordance with the data associated with the content, the portable device 6-2 reproduces the content stored therein and outputs it to a headphone or the like (not shown). A user may remove the portable device 6-2, in which the content is stored, from the personal computer 1, and may carry it to reproduce the content and listen to music corresponding to the content via a headphone or the like.

[0030] Similarly, the portable device 6-3 stores a content supplied from the personal computer 1 together with associated data. In accordance with the data associated with the content, the portable device 6-3 reproduces the content stored therein and outputs it to a headphone or the like (not shown). A user may remove the portable device 6-3, in which the content is stored, from the personal computer 1, and may carry it to reproduce the content and listen to music corresponding to the content via a headphone or the like.

[0031] In the following discussion, in the case where one of the portable devices 6-1 to 6-3 is described without specifying a particular one, it is represented simply as a portable device 6.

[0032] Fig. 2 illustrates a configuration of the personal computer 1. A CPU (central processing unit) 11 executes various application programs (which will be described in detail later) and an OS (operating system). A ROM (read only memory) 12 stores a fixed part of a program and/or a fixed parameter used by the CPU 11. A RAM (random access memory) 13 stores a program executed by the CPU 11 and/or a parameter which may vary during the execution of the program. These elements are connected to one another via a host bus 14 such as a CPU bus.

[0033] The host bus 14 is connected to an external bus 16 such as a PCI (peripheral component interconnect/interface) bus via a bridge 15.

[0034] A keyboard 18 is used by a user to input various commands to the CPU 11. A mouse 19 is used by the user to designate or select a point on the screen of a display 20. The display 20 may be a liquid crystal display or a CRT (cathode ray tube) display and it servers to display various kinds of information in the form of a text or an image. An HDD (hard disk drive) 21 drives a hard disk so as to record or reproduce a program executed by the CPU 11 or other information.

[0035] The drive 22 reads data or a program from a magnetic disk 41, an optical disk (such as a CD) 42, a magnetooptical disk 43, or a semiconductor memory 44 loaded on the drive 22 and supplies the resultant data or program to a RAM 13 via an interface 17, the external bus 16, the bridge 15, and the host bus 14.

[0036] A USB port 23-1 is connected to the portable device 6-1 via a USB cable 7-1. The USB port 23-1 outputs data (such as a content or a command to the portable device 6-1) supplied from the HDD 21, the CPU 11, or the RAM 13 via the interface 17, the external bus 17, the bridge 15, and/or the host bus 14, to the portable device 6-1.

[0037] A USB port 23-2 is connected to the portable device 6-2 via a USB cable 7-2. The USB port 23-2 outputs data (such as a content or a command to the portable device 6-2) supplied from the HDD 21, the CPU 11, or the RAM 13 via the interface 17, the external bus 17, the bridge 15, and/or the host bus 14, to the portable device 6-2.

[0038] A USB port 23-3 is connected to the portable device 6-3 via a USB cable 7-3. The USB port 23-3 outputs data (such as a content or a command to the portable device 6-3) supplied from the HDD 21, the CPU 11, or the RAM 13 via the interface 17, the external bus 17, the bridge 15, and/or the host bus 14, to the portable device 6-3.

[0039] An audio input/output interface 24 has an IEC (International Electrotechnical Commission) 60958 terminals 24a and executes an interfacing process to input/output digital audio data or analog audio data. A loudspeaker 45 generates a voice/sound corresponding to the content in accordance with the audio signal supplied via the audio input/output interface 24.

[0040] The above-described parts from the keyboard 18 to the audio input/output interface 24 are connected to an interface 17 which is connected to the CPU 11 via the external bus 16, the bridge 15, and the host bus 14.

[0041] A communication device 25 is connected to the network 2 so that data (such as a registration request or a content transmission request) supplied from the CPU 11 or the HDD 21 is transmitted in the form of packets via the network 2. The communication device 25 is also used to receive data (such as an authentication key or a content) in the form of packets and supply the received data to the CPU 11, the RAM 13, or the HDD 21.

[0042] An adapter 26 has a CPU 32 which is generally constructed in the form of a semiconductor integrated circuit.

When the adapter 26 is mounted on the personal computer 1, the CPU 32 cooperates with the CPU 11 via the external bus 16, the bridge 15, and the host bus 14 so as to execute various processes. A RAM 33 is used to store data or a program required for the CPU 32 to execute various processes. A nonvolatile memory 34 stores data which is needed to be held after the power of the personal compute 1 is turned off. A ROM 36 stores a program for decrypting an encrypted program received from the personal computer 1. An RTC (real time clock) 35 performs a clocking operation and supplies time information.

[0043] The communication device 25 and the adapter 26 are connected to the CPU 11 via the external bus 16, the bridge 15, and the host bus 14.

[0044] In the following discussion, when one of the USB ports 23-1 to 23-3 is described without specifying a particular one, it is represented simply as a USB port 23. Similarly, when one of the USB cables 7-1 to 7-3 is described without specifying a particular one, it is represented simply as a USB cable 7.

[0045] The configuration of the portable device 6 is described below with reference to Fig. 3. A power supply circuit 52 receives a power supply voltage from a dry battery 51 and converts it internal power with a predetermined voltage. The resultant power is supplied to various parts from the CPU 53 to the display 67 over the entire portable device 6.

[0046] When a USB controller 57 is connected to the personal computer 1 via a USB connector 56 and a USB cable 7, if the USB controller 57 receives data such as a content from the personal computer 1, the USB controller 57 transfers it to the CPU 53 via an internal bus 58.

[0047] The data transmitted from the personal computer 1 is formed of packets each consisting of 64 bytes, and the data is transmitted at a rate of 12 Mbits/sec. The data transmitted into the portable device 6 is formed of a header and a content (as will be described in detail later).

[0048] If the portable device 6 receives a content write command together with a content from the personal computer 1, the CPU 53 controls the flash memory controller 60 so as to write the content received from the personal computer 1 into the flash memory 61 in accordance with the write command, under the control of the main program loaded from the ROM 55 into the RAM 54.

[0049] The flash memory has a storage capacity of about 64 Mbytes available for storing contents. The flash memory 61 includes a reproduction code for decompressing a compressed content according to a predetermined method.

[0050] The flash memory 61 is constructed in the form of a memory card which may be removed from the portable device 6.

[0051] If a user presses a play/stop button (not shown), and if, as a result, a play command is supplied to the CPU 53 via a command key controller 62, the CPU 53 controls the flash memory controller 60 so as to read a reproduction code and a content from the flash memory 61 and transfer them to a DSP 59.

[0052] In accordance with the reproduction code received from the flash memory 61, the DSP 59 performs a CRC (cyclic redundancy check) error detection operation upon the content and then reproduces it. The reproduced data (denoted by D1 in Fig. 3) is supplied to a digital-to-analog converter 63.

[0053] The DSP 59 reproduces a content in synchronization with a master clock MCLK generated by an internal oscillator circuit coupled with an oscillator 59A which includes an external quartz resonator. To the digital-to-analog converter 63, the DSP 59 also supplies the master clock MCLK, a bit clock BCLK with a predetermined frequency generated by the internal oscillator circuit on the basis of the master clock MCLK, and operation clocks LRCLK including an L-channel clock LCKL and an R-channel clock RCLK with a period corresponding to the frame interval.

[0054] The DSP 59 supplies the above-described operation clocks to the digital-to-analog converter 63 in accordance with the reproduction code when a content is being reproduced. However, when no content is reproduced, the DSP 50 stops the supply of the operation clocks in accordance with the reproduction code, thereby stopping the operation of the digital-to-analog converter 63 so as to reduce the total power consumption of the portable device 6.

[0055] Similarly, the CPU 53 and the USB controller 57 have external oscillators 53A and 57A, respectively, each including a quartz resonator, and they perform various operations in accordance with master clocks MCLK supplied from the oscillators 53A and 57A.

[0056] By forming the portable device 6 in the above-described manner, it becomes unnecessary for the portable device 6 to include a clock generator module for supplying a clock to circuit blocks such as the CPU 53, the DSP 59, and the USB controller 57. This results in a simplification in the circuit configuration and also a reduction in size.

[0057] The digital-to-analog converter 63 converts the reproduced content to an analog audio signal and supplies the resultant signal to an amplifier 64. The amplifier 64 amplifies the audio signal and supplies the amplified audio signal to a headphone (not shown) via a headphone jack 65.

[0058] As described above, when the play/stop button (not shown) of the portable device 6 is pressed, a content stored in the flash memory 61 is reproduced under the control of the CPU 53. If the play/stop button is pressed during the reproducing operation, the reproduction of the content is stopped.

[0059] After stopping the reproduction, if the play/stop button of the portable device 6 is pressed again, the reproduction of the content is restarted from the position where the reproduction has been stopped, under the control of the CPU 53. If no operation is performed for several seconds after the play/stop button was pressed to stop the reproduc-

tion, the portable device 6 automatically turns off the power so as to reduce the power consumption.

[0060] If the play/stop button is pressed after the power has been turned off, the portable device 6 starts reproducing the content not from the position where the reproduction has been stopped by the previous operation of pressing the play/stop button, but from the beginning of the content.

[0061] The CPU 53 of the portable device 6 controls the LCD controller 66 so as to display, on the display unit 67, information as to the reproduction mode (such as a repeat mode, a scan-and-play mode) the equalizer controller (gain controller for controlling the gains of an audio signal for various frequency bands), the content number, the play time, the operation status (play, stop, fast-forward, reverse), the sound volume, and the remaining capacity of the dry battery 51.

[0062] Furthermore, the portable device 6 includes an EEPROM 68 which stores a FAT (file allocation table) representing the number of contents stored in the flash memory 61, the block locations of the flash memory 61 where the contents are stored, and other various kinds of memory storage information.

[0063] In the present embodiment, each content is handled in units of blocks each including 64 Kbytes, and the block location of each content is described in the FAT.

[0064] In the case where the FAT is stored in the flash memory 61, the FAT is stored as follows. For example, if a first content is written into the flash memory 61 under the control of the CPU 53, the block location of the first content is written in the FAT in the flash memory 61. If a second content is written thereafter in the flash memory 61, the block location of the second content is written in the FAT in the flash memory 61 (in the same memory area as the first content).

[0065] As described above, the FAT is updated each time a content is written into the flash memory 61, and the same data is written in a duplicated fashion for the purpose of backup.

[0066] If the FAT is written in the flash memory 61, the same area of the flash memory 61 is rewritten twice each time a content is written. As a result, a small number of operations of writing contents into the flash memory 61 causes the number of rewriting operations to reach the maximum allowable number, and it becomes impossible to further rewrite the flash memory 61.

[0067] In the portable device 6, in order to avoid the above problem, the FAT is stored in the EEPROM 68 instead of the flash memory 61 thereby reducing the number of operations of rewriting the flash memory 61 required each time a content is written.

[0068] In the portable device 6, because the FAT which is frequently rewritten is stored in the EEPROM 68, the maximum allowable number of writing operations becomes several ten times or more greater than can be when the FAT is stored in the flash memory 61. Furthermore, the CPU 53 controls the EEPROM 68 such that the FAT is written in an appended fashion, thereby reducing the number of writing operation into the same area of the EEPROM 68 and thus preventing the EEPROM 68 from becoming unusable in a short time.

[0069] If the portable device 6 is connected to the personal computer 1 via the USB cable 7 (hereinafter, this state is represented as a USB-connected state), the USB controller 57 sends an interrupt signal to the CPU 53. Thus, the CPU 53 recognizes that the portable device 6 has been connected to the personal computer 1.

[0070] As a result, a current with a predetermined magnitude is supplied from the personal computer 1 to the portable device 6 via the USB cable 7. Furthermore, the CPU 53 controls the power supply circuit 52 such that the supply of power from the dry battery 51 is stopped.

[0071] When the portable device 6 is in the USB-connected state, the CPU 53 controls the DSP 59 so as to stop reproducing a content thereby preventing the external power supplied from the personal computer 1 from exceeding the maximum allowable current and thus allowing specified external power to be supplied to the portable device 6.

[0072] When the portable device 6 is USB-connected, the CPU 53 switches the power supply from the dry battery 51 to that supplied from the personal computer 1 as described above, so that the external electric power which is supplied from the personal computer 1 and which needs lower cost is used instead of using the dry battery 51 which needs higher power cost. This saves the life of the dry battery 51.

[0073] When external power is supplied to the portable device 6 from the personal computer 1 via the USB cable 7, the CPU 53 stops the reproducing operation of the DSP 59 thereby reducing radiation from the DSP 59 and thus reducing the total radiation from the system including the personal computer 1.

[0074] Fig. 4 is a block diagram illustrating the functions of the personal computer 1 achieved by means of executing a program by the CPU 11. A content management program 111 is formed of a plurality of programs including an RMD selection program 131,s a check-in/check-out management program 132, an encryption method conversion program 135, a compression method conversion program 136, an encryption program 137, a usage rule conversion program 139, a usage rule management program 140, an authentication program 141, a decryption program 142, a PD driver 143, a purchase program 144, and a purchase program 145.

[0075] The content management program 111 is described by shuffled or encrypted instructions so that the instructions are concealed from the outside. This makes it difficult for an unauthorized user to analyze the instructions (more specifically, if the unauthorized user directly reads the purchase program 144, it is impossible to analyze the instruc-

tions).

[0076] The EMD selection program 131 is not included in the content management program 111 initially installed in the personal computer 1, but the EMD selection program 131 is downloaded from an EMD registration serer 3 via the network during an EMD registration process which will be described later. The EMD selection program 131 selects one of EMD servers 4-1 to 4-3 and connects the personal computer 1 to the selected EMD server. After achieving the connection, the purchase application program 115 or the purchase program 144 or 145 communicates with the selected EMD server of the EMD servers 4-1 to 4-3 (so as to download a content to be purchased).

[0077] The check-in/check-out management program 132 checks out a content stored in one of the content files 161-1 to 161-N to one of the portable devices 6-1 to 6-3 or checks in a content stored in one of the portable device 6-1 to 6-3, in accordance with the check-in/check-out conditions and the usage rule files 162-1 to 162-N stored in the content database 114.

[0078] Depending on the check-in/check-out process performed, the check-in/check-out management program 132 updates the usage rule data described in the usage rule files 162-1 to 162-N stored in the content database 114.

[0079] A copying management program 133 copies a content stored in one of content files 161-1 to 161-N into one of portable devices 6-1 to 6-3 or copies a content from one of portable devices 6-1 to 6-3 into the content database 114, in accordance with the usage rule files 162-1 to 162-N described in the content database 114.

[0080] A movement management program 134 moves a content stored in one of content files 161-1 to 161-N into one of portable devices 6-1 to 6-3 or moves a content from one of portable devices 6-1 to 6-3 into the content database 114, in accordance with the usage rule files 162-1 to 162-N described in the content database 114.

[0081] The encryption conversion program 135 converts the encryption method of a content received from the EMD server 4-1 via the network 2 under the control of the purchase application program 115, or the encryption method of a content received from the EMD server 4-2 under the control of the purchase program 144, or the encryption method of a content received from the EMD server 4-3 under the control of the purchase program 145, into the same encryption method as that of contents stored in the content files 161-1 to 161-N stored in the content database 114.

[0082] The encryption method conversion program 135 also performs a conversion when a content is checked out into any of the portable devices 6-1 to 6-3 such that the content is encrypted according to an encryption method which can be decrypted by the portable devices 6-1 to 6-3.

[0083] The compression method conversion program 136 converts the compression method of a content received from the EMD server 4-1 via the network 2 under the control of the purchase application program 115, the compression method of a content received from the EMD server 4-2 under the control of the purchase program 144, or the encryption method of a content received from the EMD server 4-3 under the control of the purchase program 145, into the same compression method as that of contents stored in the content files 161-1 to 161-N stored in the content database 114.

[0084] When a content is checked out into any of the portable devices 6-1 to 6-3, the compression method conversion program 136 converts the compression method of the content to be checked out into a conversion method which is allowed in the portable device 6-1 or 6-3.

[0085] If the encryption program 137 receives, from the recording program 113, a content (not encrypted) read from for example a CD, the encryption program 137 encrypts the received content in accordance with the same encryption method as that of contents of the content files 161-1 to 161-N stored in the content database 114.

[0086] If the compression/decompression program 138 receives, from the recording program 113, a content (not compressed) read from for example a CD, if the compression/decompression program 138 compresses the received content in accordance with the same compression method as that of contents of the content files 161-1 to 161-N stored in the content database 114. The compression/decompression program 138 also decompresses a compressed content, as required.

[0087] The usage rule conversion program 139 the usage rule data associated with a content received from the EMD server 4-1 via the network 2 under the control of the purchase application program 115, the usage rule data associated with a content received from the EMD server 4-2 under the control of the purchase program 144, or the usage rule data associated with a content received from the EMD server 4-3 under the control of the purchase program 145, into the same format as that of the usage rule data described in the usage rule files 162-1 to 162-N stored in the content database 114.

[0088] The usage rule conversion program 139 also performs a conversion when a content is checked out into any of the portable devices 6-1 to 6-3 such that the usage rule data associated with the checked-out content becomes usable by the portable devices 6-1 to 6-3.

[0089] Before copying, moving, checking-in, or checking-out a content, the usage rule management program 140 checks whether the usage rule data has been tempered, on the basis of the hash value (which will be described later) corresponding to the usage rule data described in the usage rule files 162-1 to 162-N stored in the content database 114. If usage rule data described in any of the usage rule files 162-1 to 162-N stored in the content database 114 is updated in response to the operation of copying, moving, checking-in or checking-out a content, the usage rule management program 140 updates the hash value corresponding to the updated usage rule data.

[0090] The authentication program 141 performs mutual authentication between the content management program 111 and the purchase application program 115, and also performs mutual authentication between the content management program 111 and the purchase program 144. The authentication program 141 includes an authentication key used in the mutual authentication process between the EMD server 4-1 and the purchase application program 115, between the EMD server 4-2 and the purchase program 144, and between the EMD server 4-3 and the purchase program 145.

[0091] The authentication key used by the authentication program in the mutual authentication is not included in the authentication program 141 when the content management program 111 is installed into the personal computer 1. When registration has been successfully performed by the display control program 112, the authentication key is supplied from the EMD registration server 3 and stored in the authentication program 141.

[0092] When the personal computer 1 reproduces a content stored in any of the content files 161-1 to 161-N in the content database 114, the decryption program 142 decrypts the content.

[0093] When a content is checked out into the portable device 6-2 or when a content is checked in from the portable device 6-2, the PD driver 143 supplies the content to the portable device 6-2 and sends a command to the portable device 6-2 to perform the checking-out or checking-in process.

[0094] When a content is checked out into the portable device 6-1 or when a content is checked in from the portable device 6-1, the PD driver 143 supplies the content to the device driver 116-1 and sends a command to the device driver 116-1 to perform the checking-out or checking-in process.

[0095] When a content is checked out into the portable device 6-3 or when a content is checked in from the portable device 6-3, the PD driver 143 supplies the content to the device driver 116-2 and sends a command to the device driver 116-2 to perform the checking-out or checking-in process.

[0096] The purchase program 144 is a so-called plug-in program which is installed together with the content management program 111. The purchase program 144 may be supplied from the EMD registration server 3 via the network 2 or may be supplied via a CD. When the purchase program 144 is installed into the personal computer 1, the purchase program 144 exchange data with the content management program 111 via an interface in a predetermined form provided in the content management program 111.

[0097] The purchase program 144 is described by shuffled or encrypted instructions so that the instructions are concealed from the outside. This makes it difficult for an unauthorized user to analyze the instructions (more specifically, if the unauthorized user directly reads the purchase program 144, it is impossible to analyze the instructions).

[0098] The purchase program 144 requests via the network 2 the EMD server 4-2 to transmit a desired content, and receives the content from the EMD server 4-2. The purchase program 144 performs an accounting process when a content is received from the EMD server 4-2.

[0099] The purchase program 145 is installed together with the content management program 111. The purchase program 145 requests via the network 2 the EMD server 4-3 to transmit a desired content, and receives the content from the EMD server 4-3. The purchase program 145 performs an accounting process when a content is received from the EMD server 4-3.

[0100] The display control program 112 displays a window image on the display 20 in accordance with the filtering data file 181, the display data file 182, the image files 183-1 to 183-K, and the history data file 184. In response to an operation performed by a user upon the keyboard 18 or the mouse 19, the display control program 112 sends a command to the content management program 111 to perform checking-in, checking-out, or other processes.

[0101] The filtering data file 181 is stored on the HDD 21 and includes data representing the weighting factors of the respective contents described in the content files 161-1 to 161-N stored in the content database 114.

[0102] The display data file 182 is stored on the HDD 21 and includes data corresponding to the contents described in the respective content files 161-1 to 161-N stored in the content database 114.

[0103] The image files 183-1 to 183-K are stored on the HDD 21 and include images corresponding to the contents described in the respective content files 161-1 to 161-N stored in the content database 114 or include images corresponding to packages which will be described later.

[0104] In the following discussion, in the case where one of the image files 183-1 to 183-K is described without specifying a particular one, it is represented simply as an image file 183.

[0105] The history data file 184 is stored on the HDD 21 and includes history data representing, for example, dates and the number of times the contents described in the content files 161-1 to 161-N stored in the content database 114 have been checked out or checked in.

[0106] When registration is performed, the display control program 112 transmits identification data, which has been stored in advance, of the content management program 111 to the EMD registration server 3 via the network 2. Furthermore, the display control program 112 receives the authentication key and the EMD selection program 131 from the EMD registration server 3 and transfers the received authentication key and EMD selection program to the content management program 111.

[0107] The recording program 113 display a predetermined window image and, in response to an operation per-

formed by a user upon the keyboard 18 or the mouse 19, reads data representing such as the recording time of a content, from an optical disk such as CD 42 mounted on the drive 22.

[0108] On the basis of the data representing for example the recording time of a content recorded on a CD, the recording program 113 requests via the network 2 the WWW server 5-1 or 5-2 to send data corresponding to the CD (for example, the album title or the artist name) or data corresponding to the content recorded on the CD (for example, the content title), and receives data corresponding to the CD or data corresponding to the content recorded on the CD from the WWW server 5-1 or 5-2.

[0109] If the recording program 113 receives the data corresponding to the CD or the data corresponding to the content recorded on the CD, the recording program 113 supplies the received data to the display control program 112.

[0110] If a recording command is input, the recording program 113 reads the content from the optical disk or the CD 42 mounted on the drive 22 and the outputs the content to the content management program 111.

[0111] If the content database 114 receives from the content management program 111 a content compressed according to a predetermined compression method and encrypted according to a predetermined encryption method, the content database 114 stores the received content into one of the content files 161-1 to 161-N. The content database 114 also stores usage rule data corresponding to the contents of the content files 161-1 to 161-N in the usage rule files 162-1 to 162-N (on the HDD 21) corresponding to the respective content files 161-1 to 161-N.

[0112] The content database 114 may store the content files 161-1 to 161-N or the usage rule files 162-1 to 162-N in the form of records.

[0113] For example, the usage rule data associated with the content stored in the content file 161-1 is stored in the usage rule file 162-1. Similarly, the usage rule data associated with the content stored in the content file 161-N is stored in the usage rule file 162-N.

[0114] In the following discussion, in the case where one of the content files 161-1 to 161-N is described without specifying a particular one, it is represented simply as a content file 161. Similarly, when one of the content files 162-1 to 162-N is described without specifying a particular one, it is represented simply as a content file 162.

[0115] The purchase application program 115 may be supplied from the EMD registration server 3 via the network 2 or may be supplied via a CD-ROM. The purchase application program 115 requests via the network 2 the EMD server 4-1 to transmit a content. If the purchase application program 115 receives the content from the EMD server 4-1, the purchase application program transfers the received content to the content management program 111. The purchase application program 115 performs an accounting process when the content is received from the EMD server 4-1.

[0116] Under the control of the content management program 111, the driver 117 drives the audio input/output interface 24 so as to input a content in the form of digital data from the outside and transfer it to the content management program 111, or output a content in the form of digital data supplied from the content database 114 via the content management program 11, or output an analog signal corresponding to a content supplied from the content database 114 via the content management program 11.

[0117] A method of preventing a content stored in the flash memory 61 (such as a Memory Stick (trade mark)) of the portable device 6 from being copied in an unauthorized manner is described below.

[0118] A content file stored in the flash memory 61 of the portable device 6 includes a header portion and a data portion, as shown in Fig. 5. In the header portion, information as to the content identifier, the number of reproducing operations, the reproduction limit, the content title, and the artist name is described, On the other hand, in the data portion, a content compressed according to a compression method such as ATRAC-3 and encrypted is described. In order to prevent the content from being tempered, an MAC (message authentication code) value is described in the header portion of the content file. The MAC value is calculated using a unidirectional function (such as SHA or DES) called a keyed hash in accordance with equation (1) shown below:

$$\text{MAC Value} = \text{MAC}(\text{Kc, Important Information}) \quad (1)$$

where Kc is the content key (encryption key) used to encrypt the content described in the data portion, and Important Information is particular part (as to, for example, the content identifier, the number of reproducing operations performed, and the reproduction limit) of the information described in the header portion.

[0119] The content identifier is assigned to the content to identify the content. The content title is data representing the title of the content in the ASCII (American National Standard Code for Information Interchange) code. The artist name is data representing, in the ASCII code, the artist name, the songwriter name, and/or the composer name associated with the content.

[0120] The reproduction limit is data indicating whether the period of time (start date/time, expiration date/time) during which the content is allowed to be reproduced or the limit of the number of reproducing operations (the maximum allowable number of operations of reproducing the content) is set or not. When the limit of the number of reproducing operations is specified, the reproduction limit is set to "1", while it is set to "2" when the period of time is specified. When neither the limit of the number of reproducing operations nor the period of time is specified (as is the case when the

content is purchased), the reproduction limit is set to "0".

[0121] When the reproduction limit is set to "1" or "2", the value of the number of reproducing operations is updated by the CPU 53 each time the content is reproduced so that it indicates the number of times the content has been reproduced.

[0122] Fig. 6 illustrates the process performed by the personal computer 1 to reproduce a content, such as that shown in Fig. 5, stored in the flash memory 61 of the portable device 6. In step S1, the authentication program 141 of the personal computer 1 performs mutual authentication with the CPU 53 of the portable device 6 and acquires the common communication key Ks. Using the communication key Ks, the authentication program 141 acquires the encryption key Kc used to encrypt the content described in the data portion of the flash memory 61.

[0123] More specifically, the authentication program 141 performs mutual authentication with the CPU 53 and acquires a communication key Ks_1. On the other hand, the CPU 53 performs mutual authentication with the flash memory 61 via the internal bus 58 and the flash memory controller 60, and acquires a common communication key Ks_2.

[0124] If the mutual authentication process is unsuccessful, the reproduction process is terminated. If the mutual authentication is successful, the flash memory 61 decrypts the encryption key Kc (encrypted using the storage key) stored therein using the storage key which is also stored therein. The flash memory 61 then encrypts the encryption key Kc with the communication key Ks_2 and transmits it to the CPU 53 via the flash memory controller 60 and the internal bus 58. The CPU 53 decrypts the received encryption key Kc using the communication key Ks_2.

[0125] Furthermore, the flash memory 61 reads the important information and the previous MAC value described in the header portion of a content file (Fig. 5). The flash memory 61 encrypts the important information and the previous MAC value with the communication key Ks_2 and transmits them to the CPU 53. Upon reception of the important information and the previous MAC value, the CPU 53 decrypts them using the communication key Ks_2.

[0126] The CPU 53 encrypts the encryption key Kc, the important information, and the previous MAC value with the communication key Ks_1 with the communication key Ks_1 and transmits them to the authentication program 141 of the personal computer 1. The authentication program 141 decrypts them using the decryption program 142 in accordance with the communication key Ks_1.

[0127] As described above, when contents are transmitted between the flash memory 61 and the CPU 53 or between the CPU 53 and the authentication program 141, the contents are encrypted using the communication key Ks_2 or Ks_1. However, such an encryption process is not described in the following discussion unless it is described for the purpose of emphasis.

[0128] In step S2, the user condition management program 140 calculates the MAC value from the encryption key Kc and the important information described in the header portion of the content file obtained in step S1, in accordance with equation (1) described above. The resultant value is substituted into R. In step S3, the usage rule management program 140 compares the value of R calculated in step S2 with the previous MAC value described in the header portion of the content file. If these two values are not equal to each other, the usage rule management program 140 goes to step S4. In step S4, the display control program displays a message such as "There is a possibility that the content may have be tampered." on the display 20, and the process is terminated. In this case, the content stored in the flash memory 61 of the portable device 6 is regarded as being tampered, and thus it is not reproduced.

[0129] In the case where it is determined in step S3 that the value of R and the previous MAC value described in the header portion of the content file are equal to each other, the process goes to step S5. In step S5, the content management program 111 receives the encrypted content from the flash memory 61 via the CPU 53. The received encrypted content is then decrypted by the decryption program 142 using the encryption key Kc. The decrypted content is applied to the compression/decompression program 138 to decompress it. The resultant content is output (reproduced) via the audio input/output interface 24.

[0130] In step S6, the usage rule management program 140 controls the CPU 53 so as to increment, by 1, the number of reproduction operations described in the important information in the header portion of the content file. Furthermore, in step S7, the use management program 140 controls the CPU 53 so as to calculate the MAC value using the updated important information (in which the number of reproduction operations has been incremented by 1) in accordance with equation (1) and update the MAC value described in the header portion of the content file stored in the flash memory 61 with the calculated value. Because the calculation of the MAC value needs the encryption key Kc, the MAC value can be calculated only when the device or the use management program 140 is authorized.

[0131] However, the technique described above with reference to Fig. 6 cannot prevent a content from being copied in an unauthorized manner using a technique described below with reference to Fig. 7. That is, a content file (having an MAC value equal to MAC-1) stored in the flash memory 61-1 of the portable device 6-1 (that is, the flash memory of the first portable device 6-1) is backed up into the content database 114 in the HDD 21 so that the content file is stored as a content file 161-1 (MAC-1) in the content database 114. After the above backing-up process, the original content file (MAC-1) remains in the flash memory 61-1.

[0132] Thereafter, the content file (MAC-1) stored in the flash memory 61-1 is moved into the content database 114. As a result, a content file 161-2 (MAC-1) is stored in the content database 114. As a result of the movement of the con-

tent file, the content file (MAC-1) is deleted from the flash memory 61-1, and the content database 114 includes two content files 161-1 (MAC-1) and 161-2 (MAC-1).

[0133] Thereafter, the content file 161-1 (MAC-1) stored in the content database 114 is restored into the flash memory 61-1. As a result, the content file 161-2 (MAC-1) is left in the content database 114. After that, the content file 161-2 (MAC-1) is moved from the content database 114 into the flash memory 61-2 of the portable device 6-2 (the flash memory 61 of the second portable device 6-2). As a result, the same content file (MAC-1) has been stored into the two flash memories 61-1 and 61-2. Thus, the personal computer 1 can reproduce the content file 161-2 (MAC-1) stored in the flash memory 61-2 as well as the content file 161-1 (MAC-1) stored in the flash memory 61-1.

[0134] In the present invention, to prevent contents from being copied in the unauthorized manner described above, the MAC value may be determined in accordance with equation (2) described below.

$$\text{MAC Value} = \text{MAC}(\text{Kc}, \text{seq\#} \,||\, \text{Important Information}) \quad (2)$$

In equation (2), seq# is a variable which is updated (for example, incremented) each time a content is moved or copied. The variable seq# is stored in the 0th block of a media defect list which is stored in the flash memory 61 and which is not allowed to be accessed by a usual program (which is allowed to be accessed only by the adapter 26 or the usage rule management program 140). In equation (2), symbol || is used to represent concatenation (connection). More specifically, A || B represents data (a + b bits) produced by simply connecting data A (a bits) and data B (b bits) in such a manner as to place data B immediately following the least significant bit of data A.

[0135] The media defect list represents, as shown in Fig. 8A, defective (bad) blocks (blocks including a defect) and alternative blocks which are used instead of the respective defective blocks. If a block is registered as a defective block in this list, the reading and writing of that block is basically disabled, and data is read or written from or to an alternative block corresponding to that block. However, a block having no defect is registered as the 0th defective block so that this block is used by the CPU 53 when a special command is received. The variables seq# are stored in this 0th defective block as shown in Fig. 8B.

[0136] The special command can be issued only by the adapter 26 and the usage rule management program 140, Therefore, only the adapter 26 and the usage rule management program 140 can access the 0th defective block.

[0137] The variables seq# are assigned to respective contents (tracks) in a one-to-one fashion. Therefore, the recalculation of the MAC value is performed content by content (track by track).

[0138] The area where the variables seq# are stored is not limited to the 0th defective block of the media defect list. Alternatively, the variables seq# may be stored in another storage area the reading/writing of which is disabled for the other purposes.

[0139] Fig. 9 illustrates the process of moving a content from the flash memory 61 into the HDD 21.

[0140] In step S21, the CPU 53 performs mutual authentication with the flash memory 61 and acquires the encryption key Kc. In step S22, the authentication program 141 of the personal computer 1 performs mutual authentication with the CPU 53 of the portable device 6 and acquires the communication key Ks which is used by both the authentication program 141 and the CPU 53. This step is performed in a similar manner to step S1 described above with reference to Fig. 6 (except that the common communication key Ks_1 is used in step S1).

[0141] In step S23, the usage rule management program 140 sends the predetermined special command to the CPU 53 so as to request the CPU 53 to update the variable seq# stored in the 0th defective block (Fig. 8B) of the media defect list (Fig. 8A) of the flash memory 61. In response to the request, the CPU 53 updates the variable seq# to a proper value.

[0142] In step S24, the CPU 53 encrypts the encryption key Kc acquired from the flash memory 61 in step S22, using the communication key Ks acquired in step S22. The resultant encryption key Kc is transmitted to the usage rule management program 140. In step S25, the CPU 53 receives encrypted content data described in the data portion of a content file stored in the flash memory 61. The CPU 53 encrypts the received data with the communication key Ks and transfers it to the movement management program 134. The movement management program 134 stores the content, transferred from the portable device 6, into the HDD 21 (content database 114). In step S26, the movement management program 134 requests the decryption program 142 to decrypt the encryption key Kc received from the portable device 6, using the communication key Ks. The resultant decrypted encryption key Kc is then decrypted by the encryption program 137 using a dedicated storage key and stored in the HDD 21.

[0143] In step S27, the movement management program 134 notifies the CPU 53 that the content file has been copied. In response, in step S28, the CPU 53 deletes the content file (which has been transmitted to the usage rule management program 140 in step S25) from the flash memory 61.

[0144] If the movement process is perform in the above-described manner, the unauthorized copying process described above with reference to Fig. 7 can be prevented. Now, let us assume that a content A is stored in the flash memory 61-1 of the portable device 6-1. In this case, the MAC value MAC-1 is described as important information of the content A in the header portion of the content A. Furthermore, the variable seq-1 is stored in the 0th defective block

of the media defect list, in correspondence with the content A (hereinafter, such a state is represented by "A(MAC-1), seq-1"). In this state, if the content file is backed up into the content database 114 in the HDD 21, the content A(MAC-1) is stored in the content database 114, and the content A(MAC-1), seq-1 remains in the flash memory 61-1 because the variable seq-1 and the MAC-1 in the flash memory 61-1 are not updated.

[0145] Thereafter, if the content A(MAC-1), seq-1 is moved from the flash memory 61-1 into the content database 114, the MAC-1 is not updated although the variable seq-1 of the flash memory 61-1 is updated to the variable seq-2 (in step S23). Thus, the content A(MAC-1) is recorded into the content database 114. The movement management program 134 informs the CPU 53 that the content A has been moved. In response, the CPU 53 deletes the content A from the flash memory 61-1.

[0146] If, thereafter, the content A(MAC-1) backed-up in the content database 114 is restored into the flash memory 61-1, a content A(MAC-1), seq-2 is stored into the flash memory 61-1. Furthermore, if the content A(MAC-1) moved into the content database 114 is moved into the flash memory 61-1 of the portable device 6-2, the variable seq-2 is further updated to a variable seq-3, and thus the content is stored as a content A(MAC-1), seq3.

[0147] If the content is reproduced from the flash memory 61-1 or 61-2 in accordance with the process shown in the flow chart of Fig. 6, the variable seq-2 (or seq-3) is used in the calculation of the MAC value in step S2, and thus the calculation result becomes different from MAC-1 described in the header portion of the content file. As a result, the determination in step S3 becomes negative. Thus, this content is regarded as an unauthorized copy and the reproduction thereof is disabled.

[0148] In the above description, the portable device 6 is employed as a storage medium by way of example. However, the present invention may also be applied, when data is copied or moved to other types of storage media.

[0149] In addition to music data and other audio data, the content data may be other types of data such as image data.

[0150] The process described above may be performed by hardware or software. In the case where the process is performed by software, the software may be a program which is installed from a program storage medium onto a computer (corresponding to the CPU 53) installed as dedicated hardware in the portable device 6, or onto a general-purpose computer capable of executing various programs installed thereon.

[0151] Various types of media may be employed as the program storage medium for storing the program which is to be installed onto a computer and executed by the computer. They include, as shown in Fig. 2, a magnetic disk 41 (such as a floppy disk), an optical disk 42 (such as a CD-ROM (compact disc-read only memory), a DVD (digital versatile disk), a magnetooptical disk 43 (such as an MD (mini-disk), a package medium such as a semiconductor memory 44, and a ROM 12 or HDD 21 for storing a program permanently or temporarily. The program may be stored into the program storage medium via a wire or wireless communication medium such as the network 2 (local area network or the Internet) or digital broadcasting, using an interface such as the communication device 25 as required.

[0152] In the present invention, the steps descried in the program stored in the program storage medium may be performed either in time sequence in accordance with the order described in the program or in a parallel or separate fashion.

[0153] Furthermore, in the present invention, the term "system" is used to describe the entire apparatus including a plurality of devices.

[0154] As described above, the present invention provides the information processing apparatus, the information method, and the program stored in a program storage medium, in which the result of a calculation performed on the basis of calculation information and an encryption key is compared with a previous calculation result, and use of stored content data is controlled in accordance with the comparison result thereby making it possible to detect content data which has been copied in an unauthorized manner and thus making it possible to prevent content data from being copied in an unauthorized manner.

Claims

1. An information processing apparatus comprising:

storage means for storing content data encrypted with an encryption key;
holding means for holding management information associated with said content data stored in said storage means;
calculation means for performing a predetermined calculation on the basis of said encryption key and calculation information included in said management information, said calculation information including update information which is updated with predetermined timing;
memory means for storing the result of the calculation performed by said calculation means; and
control means for comparing the result of the calculation performed by said calculation means with a previous calculation result stored in said memory means and controlling use of said content data stored in said storage

means in accordance with the result of the comparison.

2. An information processing apparatus according to Claim 1, wherein said calculation means performs said calculation by applying a hash function to said calculation information and said encryption key.

3. An information processing apparatus according to Claim 1, wherein:

said content data is music data;
said calculation information includes identification information identifying said music data; and
said holding means holds said update information in an area which is not allowed to be read or written for a general purpose.

4. An information processing method comprising the steps of:

storing content data encrypted with an encryption key;
holding management information associated with said content data stored in said storage step;
performing a predetermined calculation on the basis of said encryption key and calculation information included in said management information, said calculation information including update information which is updated with predetermined timing;
memory means for memorizing the result of the calculation performed in said calculation step; and
comparing the result of the calculation performed in said calculation step with a previous calculation result memorized in said memorizing step and controlling use of said content data stored in said storage step in accordance with the result of the comparison.

5. A program storage medium on which a program is stored, said program including the steps of: storing content data encrypted with an encryption key;

holding management information associated with said content data stored in said storage step;
performing a predetermined calculation on the basis of said encryption key and calculation information included in said management information, said calculation information including update information which is updated with predetermined timing;
memory means for memorizing the result of the calculation performed in said calculation step; and
comparing the result of the calculation performed in said calculation step with a previous calculation result memorized in said memorizing step and controlling use of said content data stored in said storage step in accordance with the result of the comparison.

FIG. 1

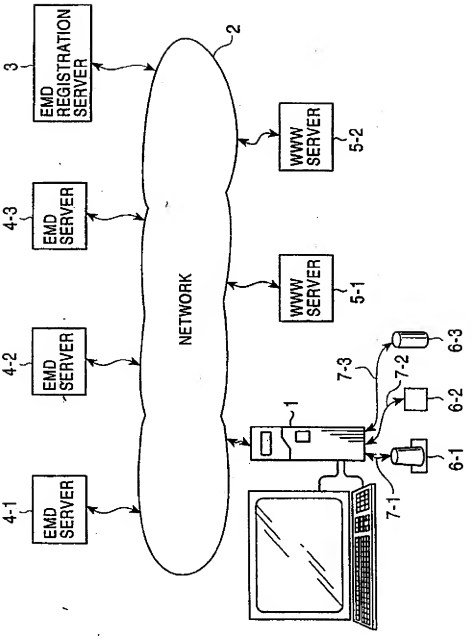

3
EMD REGISTRATION SERVER
2
NETWORK
4-1
EMD SERVER
4-2
EMD SERVER
4-3
EMD SERVER
WWW SERVER
5-1
WWW SERVER
5-2
1
7-1
7-2
7-3
6-1
6-2
6-3

FIG. 2

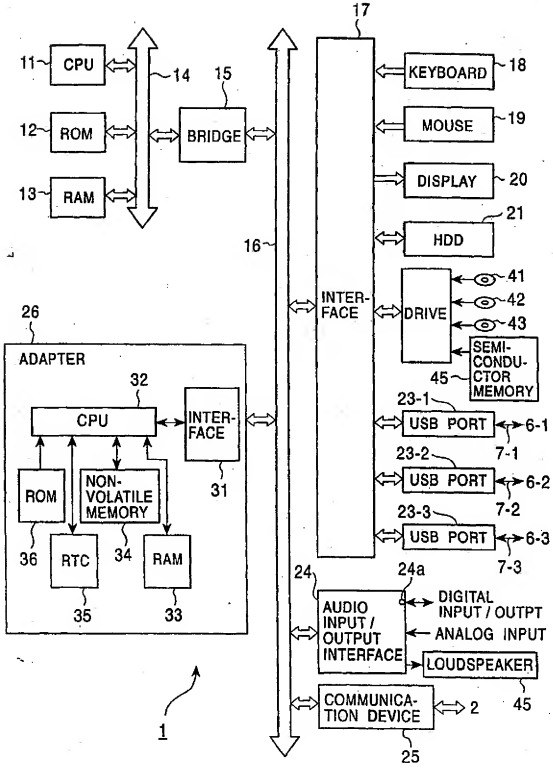
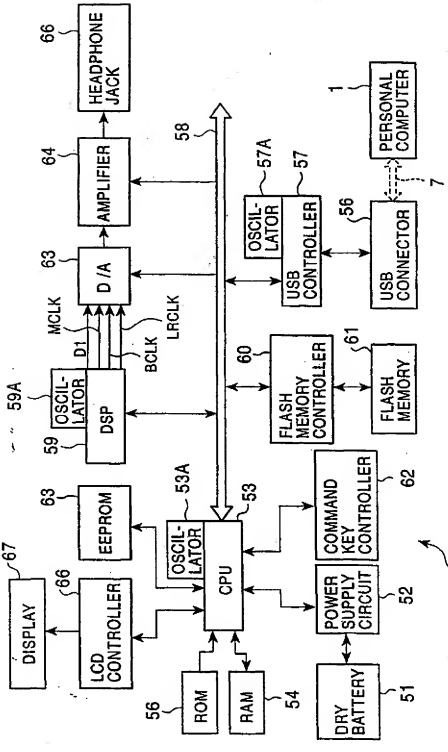

17
11
CPU
14
15
12
ROM
BRIDGE
13
RAM
16
KEYBOARD
18
MOUSE
19
DISPLAY
20
21
HDD
INTER-
FACE
DRIVE
41
42
43
SEMI-
CONDU-
CTOR
MEMORY
45
26
ADAPTER
32
CPU
INTER-
FACE
31
ROM
NON-
VOLATILE
MEMORY
36
RTC
34
RAM
35
33
23-1
USB PORT
6-1
7-1
23-2
USB PORT
6-2
7-2
23-3
USB PORT
6-3
7-3
24
24a
AUDIO
INPUT /
OUTPUT
INTERFACE
DIGITAL
INPUT / OUTPT
ANALOG INPUT
LOUDSPEAKER
COMMUNICA-
TION DEVICE
2
45
25
1

FIG. 3


DISPLAY
67
LCD CONTROLLER
66
ROM
56
RAM
54
DRY BATTERY
51
POWER SUPPLY CIRCUIT
52
CPU
53
OSCIL-LATOR
53A
EEPROM
63
OSCIL-LATOR
59
59A
DSP
D1
MCLK
BCLK
LRCLK
D /A
63
AMPLIFIER
64
HEADPHONE JACK
66
58
COMMAND KEY CONTROLLER
62
FLASH MEMORY CONTROLLER
60
FLASH MEMORY
61
USB CONTROLLER
OSCIL-LATOR
57A
57
USB CONNECTOR
56
PERSONAL COMPUTER
1
7
6

WWW SERVER
6-1
WWW SERVER
6-2
EMD SERVER
4-1
EMD SERVER
4-2
EMD SERVER
4-3
EMD RGISTRATION SERVER
3
NETWORK
2
1
CONTENT MANAGEMENT PROGRAM
111
PURCHASE APPLICATION PROGRAM
116
EMD SELECTION PROGRAM
131
CHECKIN / CHECKOUT MANAGEMENT PROGRAM
132
COPYING MANAGEMENT PROGRAM
133
MOVEMENT MANAGEMENT PROGRAM
134
ENCRYPTION METHOD CONVERSION PROGRAM
135
COMPRESSION METHOD CONVERSION PROGRAM
136
ENCRYPTION PROGRAM
137
COMPRESSION / DECOMPRESSION PROGRAM
138
USE CONDITION CONVERSION PROGRAM
139
USE CONDITION MANAGEMENT PROGRAM
140
AUTHENTICATING PROGRAM
141
DECODING DRIVER
142
PD DRIVER
143
PURCHASE PROGRAM
144
PURCHASE PROGRAM
145
RECORDING PROGRAM
113
DISPLAY CONTROL PROGRAM
112
FILTERING DATA FILE
181
DISPLAY DATA FILE
182
IMAGE FILE
183
IMAGE FILE
183-K
HISTORY DATA FILE
184
114
CONTENT FILE
161-1
USE CONDITION FILE
162-1
CONTENT FILE
161-N
USE CONDITION FILE
162-N
DRIVER
117
DEVICE DRIVER
116-2
DEVICE DRIVER
116-1
ANALOG / DIGITAL INPUT / OUTPUT
6-3
6-2
6-1

FIG. 4

FIG. 5

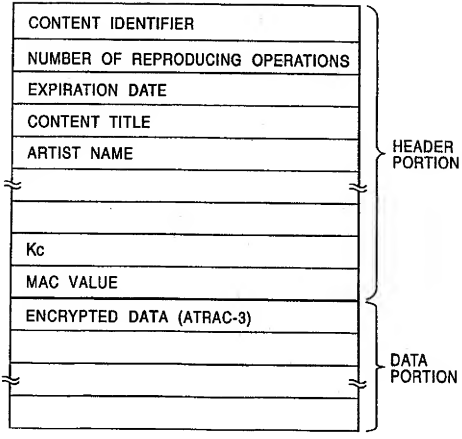

CONTENT IDENTIFIER
NUMBER OF REPRODUCING OPERATIONS
EXPIRATION DATE
CONTENT TITLE
ARTIST NAME
Kc
MAC VALUE
ENCRYPTED DATA (ATRAC-3)
HEADER PORTION
DATA PORTION

FIG. 6

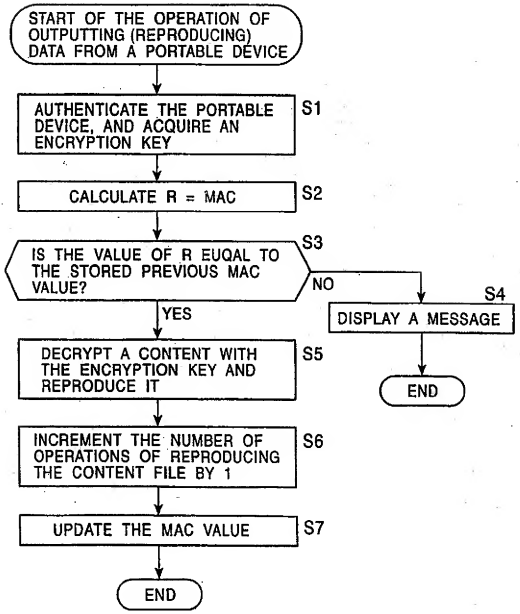

START OF THE OPERATION OF OUTPUTTING (REPRODUCING) DATA FROM A PORTABLE DEVICE
AUTHENTICATE THE PORTABLE DEVICE, AND ACQUIRE AN ENCRYPTION KEY
S1
CALCULATE R = MAC
S2
IS THE VALUE OF R EUQAL TO THE STORED PREVIOUS MAC VALUE?
S3
NO
S4
DISPLAY A MESSAGE
END
YES
DECRYPT A CONTENT WITH THE ENCRYPTION KEY AND REPRODUCE IT
S5
INCREMENT THE NUMBER OF OPERATIONS OF REPRODUCING THE CONTENT FILE BY 1
S6
UPDATE THE MAC VALUE
S7
END

FIG. 7

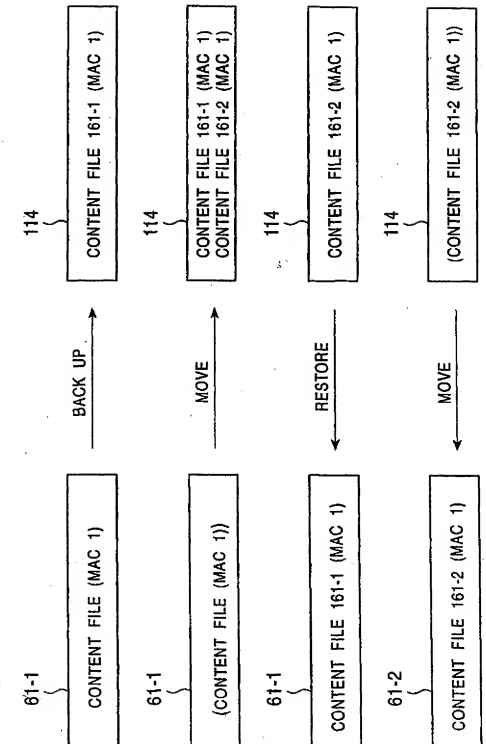

61-1
CONTENT FILE (MAC 1)
BACK UP
114
CONTENT FILE 161-1 (MAC 1)
61-1
(CONTENT FILE (MAC 1))
MOVE
114
CONTENT FILE 161-1 (MAC 1)
CONTENT FILE 161-2 (MAC 1)
61-1
CONTENT FILE 161-1 (MAC 1)
RESTORE
114
CONTENT FILE 161-2 (MAC 1)
61-2
CONTENT FILE 161-2 (MAC 1)
MOVE
114
(CONTENT FILE 161-2 (MAC 1))

FIG. 8A

	DEFECT (BAD) BLOCK	ALTERNATIVE BLOCK
0		
1		
2		
3		
4		
5		

FIG. 8B

seq 1
seq 2
seq 3
seq 4

FIG. 9

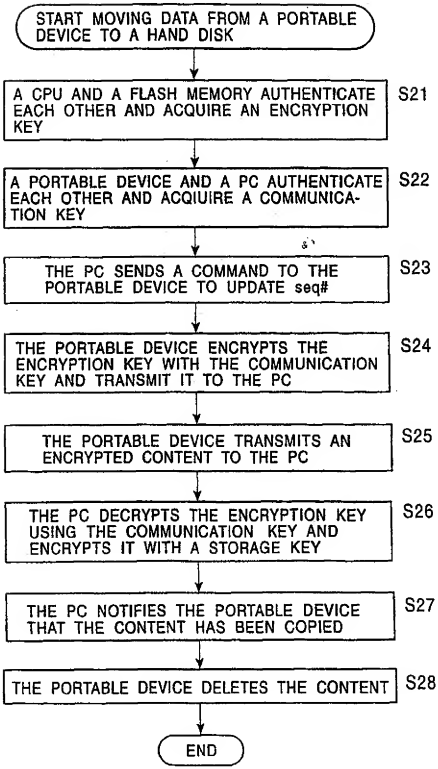
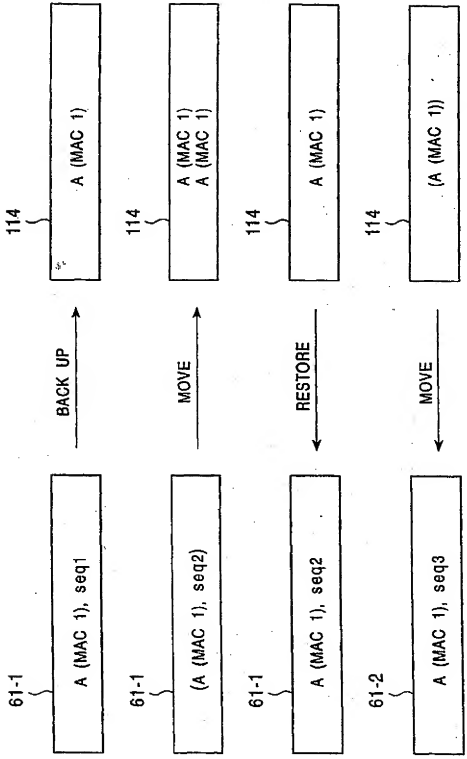

START MOVING DATA FROM A PORTABLE DEVICE TO A HAND DISK
A CPU AND A FLASH MEMORY AUTHENTICATE EACH OTHER AND ACQUIRE AN ENCRYPTION KEY
S21
A PORTABLE DEVICE AND A PC AUTHENTICATE EACH OTHER AND ACQUIRE A COMMUNICATION KEY
S22
THE PC SENDS A COMMAND TO THE PORTABLE DEVICE TO UPDATE seq#
S23
THE PORTABLE DEVICE ENCRYPTS THE ENCRYPTION KEY WITH THE COMMUNICATION KEY AND TRANSMIT IT TO THE PC
S24
THE PORTABLE DEVICE TRANSMITS AN ENCRYPTED CONTENT TO THE PC
S25
THE PC DECRYPTS THE ENCRYPTION KEY USING THE COMMUNICATION KEY AND ENCRYPTS IT WITH A STORAGE KEY
S26
THE PC NOTIFIES THE PORTABLE DEVICE THAT THE CONTENT HAS BEEN COPIED
S27
THE PORTABLE DEVICE DELETES THE CONTENT
S28
END

FIG. 10


61-1
A (MAC 1), seq1
BACK UP
114
A (MAC 1)
61-1
(A (MAC 1), seq2)
MOVE
114
A (MAC 1)
A (MAC 1)
61-1
A (MAC 1), seq2
RESTORE
114
A (MAC 1)
61-2
A (MAC 1), seq3
MOVE
114
(A (MAC 1))

(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

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(51) Int Cl.7: G11B 20/00

(43) Date of publication A2:
06.12.2000 Bulletin 2000/49

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(22) Date of filing: 30.05.2000

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Designated Extension States:
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(30) Priority: 31.05.1999 JP 15206099

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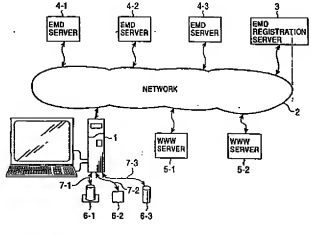
80331 München (DE)

(54) Information processing apparatus, information processing method, and program storage medium

(57) When a content is moved from a flash memory into a content database, a usage rule management program updates a variable seq-1, stored in a 0th defective block of a media defect list stored in the flash memory, to a new value seq-2. The usage rule management program calculates an MAC value (hash value) on the basis of the content stored in the data portion of the flash memory, an encrypted encryption key, and important information including the variable seq#. The usage rule management program then compares the calculated value with an MAC value stored in the header portion of the flash memory. If these two values are not equal, the usage rule management program disables reproduction of the content thereby preventing the content from being copied in an unauthorized manner.

FIG. 1



EP 1 058 255 A3

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 00 11 1587

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	"5C Digital Transmission Content Protection White Paper" ONLINE PUBLICATION, 14 July 1998 (1998-07-14), XP002213172 Retrieved from the Internet: <URL:http://www.dtcp.com/data/wp_spec.pdf> [retrieved on 2002-09-11] * the whole document * ---	1-5	G11B20/00
E	EP 1 041 573 A (SONY CORP) 4 October 2000 (2000-10-04) * paragraph [0194] * * paragraph [0185] - paragraph [0187] * * paragraph [0016] * * paragraph [0053] * * paragraph [0061] - paragraph [0063] * * paragraph [0034] * * paragraph [0031] * * paragraph [0093] - paragraph [0094] * * paragraph [0053] * * paragraph [0098] * * paragraph [0100] * * paragraph [0189] * * paragraph [0194] * * paragraph [0214] * * figures 34-36 * * claims 1-5 * ---	1-5	TECHNICAL FIELDS SEARCHED (Int.Cl.7) G11B
A,P	EP 0 978 839 A (HEWLETT PACKARD CO) 9 February 2000 (2000-02-09) * page 1 - page 15; claims 1-10 * ---	1-5	
A	EP 0 874 299 A (SONY CORP) 28 October 1998 (1998-10-28) * the whole document * -----	1-5	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	4 February 2004	Rydyger, K

CATEGORY OF CITED DOCUMENTS
X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
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O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

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04-02-2004

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		DE 60001681 D1	24-04-2003
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		EP 0978839 A1	09-02-2000
		JP 2000138664 A	16-05-2000
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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(51) Int Cl.7: **G10K 15/02**, G06F 12/00, G06F 12/14, G06F 17/30

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(30) Priority: **17.12.1999 JP 35840899**

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- **HATANAKA, Mitsuyuki, Sony Corporation**
  Shinagawa-ku, Tokyo 141-0001 (JP)
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  Shinagawa-ku, Tokyo 141-0001 (JP)
- **SHIROMA, Shin, Sony Corporation**
  Shinagawa-ku, Tokyo 141-0001 (JP)

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(54) INFORMATION PROCESSOR, PROCESSING METHOD THEREFOR, AND PROGRAM STORAGE MEDIUM

(57) An information processing device and method for recording various types of data concerning audio contents, wherein data of a predetermined number of types concerning audio contents is recorded in a main table of a display data file (182), and data of the other types concerning the audio contents is recorded in a sub-table of the display data file (182) as data of types other than the types of data recorded in the main table so as to increase the number of whole types of data to be recorded.

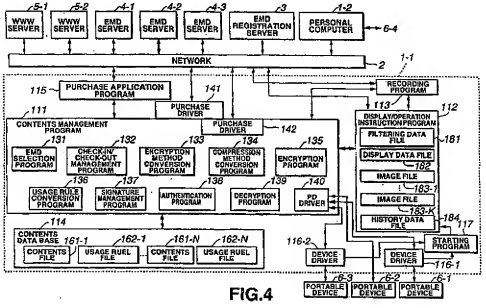

FIG.4

Printed by Jouve, 75001 PARIS (FR)

Description

Field of the Invention

[0001] The present invention relates to an information processing apparatus and method and a program storage medium, and more particularly, to an information processing apparatus and method, in which sound contents are recorded, and a program storage medium having stored therein a program to be used in the information processing apparatus and method, and under which such a sound information processing is effected.

Description of the Related Art

[0002] The information processing apparatus such as a personal computer can access an EMD (electrical music distribution) server via a predetermined network and receive a content such as musical data from the EMD server.

[0003] The EMD server transmits contents such as musical data along with data such as playback time limit or number of times of playback to the personal computer.

[0004] However, the type of data about the contents like the musical data such as the playback time limit or number of times of playback supplied along with the musical data is not always constant but vary from one EMD server or content to another.

[0005] The personal computer has to change the recording method including a data table correspondingly to the type of data about the supplied data and takes much time for processing the data.

Disclosure of the Invention

[0006] Accordingly, the present invention has an object to overcome the above-mentioned drawbacks of the conventional information processing apparatus such as a personal computer by providing an information processing apparatus and method, capable of processing a variety of data about contents flexibly and quickly to record the various content-related data, and a program storage medium having stored therein an program which is to be used in the information processing apparatus and method to effect such an information processing.

[0007] The above object can be attained by providing an information processor including, according to the present invention, a first recording means for relating a predetermined number of types of data about a first content as a first main data group with the first content and recording the data, and a second recording means for relating data of types other than the first main data group about the first content and recording in a sub data group.

[0008] In the above information processor, the first recording means relates a predetermined number of types of data about the second content as a second main data group with the second content and records the data, and the second recording means relates data of types other than the second main data group about the second content with the second content and records the data in the sub data group.

[0009] The above information processor further includes, according to the present invention, means for judging, when reading data about a content, whether the type of data to be read is that of data recorded in either the main data group or sub data group, and means for searching for data from a plurality of main data groups or sub data groups based on the result of the search made by the data searching means.

[0010] Also, the above object can be attained by providing an information processing method including, according to the present invention, a first recording step of relating a predetermined number of types of data about a first content as a first main data group with the first content and recording the data, and a second recording step of relating data of types other than the first main data group about the first content and recording in a sub data group.

[0011] In the above information processing method, at the first recording step, a predetermined number of types of data about the second content is related as a second main data group with the second content and recorded, and at the second recording step, data of types other than the second main data group about the second content are related with the second content and recorded in the sub data group.

[0012] The above information processing method further includes, according to the present invention, a judging step of judging, when reading data about a content, whether the type of data to be read is that of data recorded in either the main data group or sub data group, and a data searching step of searching for data from a plurality of main data groups or sub data groups based on the result of the search made at the data searching step.

[0013] Also the above object can be attained by providing a program storage medium having stored therein a computer-readable program for use in the above information processing apparatus and method, the program including, according to the present invention, a first recording step of relating a predetermined number of types of data about a first content as a first main data group with the first content and recording the data, and a second recording step of relating data of types other than the first main data group about the first content and recording the data in a sub data. group.

[0014] In the program stored in the above program storage medium, at the first recording step, a predetermined number of types of data about the second content is related as a second main data group with the second content and recorded, and at the second recording step, data of types other than the second main data group about the second content are related with the second content and are recorded in the sub data group.

[0015] The program stored in the above program storage medium further includes, according to the present invention, a judging step of judging, when reading data about a content, whether the type of data to be read is that of data recorded in either the main data group or sub data group, and a data searching step of searching for data from a plurality of main data groups or sub data groups based on the result of the search made at the data searching step.

[0016] These objects and other objects, features and advantages of the present intention will become more apparent from the following detailed description of the best modes for carrying out the present invention when taken in conjunction with the accompanying drawings.

Brief Description of the Drawings

[0017]

FIG. 1 is a schematic drawing of an embodiment of the music data management system incorporating the present invention;
FIG. 2 shows the architecture of a personal computer used in the music data management system in FIG. 1;
FIG. 3 shows the configuration of an EMD registration server used in the music data management system in FIG. 1;
FIG. 4 is a block diagram of the personal computer, showing the functions of the personal computer;
FIG. 5 shows an example of the content usage rule;
FIG. 6 shows an example of the relation between original package display data belonging to a display data file, and content files;
FIGS. 7A to 7C show an example of the composition of the display data file;
FIG. 8 shows an example of the relation between My Select package display data and content files;
FIG. 9 shows a relation between filtering package display data and content files;
FIG. 10 explains the operations made for EMD registration;
FIG. 11 shows an example of the display for execution of the registration;
FIG. 12 shows an example of the display made by the EMD selection program;
FIG. 13 shows an example of the display made by the purchase application program;
FIG. 14 shows an example of the display made by the purchase driver;
FIG. 15 shows an example of the display/operation instruction window;
FIG. 16 explains a window the recording program has the display unit;
FIG. 17 shows a property dialog box where it is set which of the WWW servers is to be selected;
FIG. 18 shows a property dialog box where it is set which of the WWW servers is to be selected;
FIG. 19 explains a window the recording program has the display unit;
FIG. 20 explains a window the recording program has the display unit;
FIG. 21 explains a dialog box the recording program has the display unit;
FIG. 22 explains a dialog box the recording program has the display unit;
FIG. 23 explains a dialog box the recording program has the display unit;
FIG. 24 explains a dialog box the recording program has the display unit;
FIG. 25 explains a dialog box the recording program has the display unit;
FIG. 26 explains a dialog box the recording program has the display unit;
FIG. 27 shows an example of the display/operation instruction window;
FIG. 28 shows another example of the display/operation instruction window;
FIG. 29 shows still another example of the display/operation instruction window;
FIG. 30 shows still another example of the display/operation instruction window;
FIG. 31 shows still another example of the display/operation instruction window;
FIG. 32 shows still another example of the display/operation instruction window;
FIG. 33 shows still another example of the display/operation instruction window;
FIG. 34 shows still another example of the display/operation instruction window;
FIG. 35 explains the generation of filtering package;
FIG. 36 shows an example of the display/operation instruction window;
FIG. 37 shows another example of the display/operation instruction window;
FIG. 38 shows still another example of the display/operation instruction window;
FIG. 39 shows still another example of the display/operation instruction window;
FIG. 40 shows still another example of the display/operation instruction window;
FIG. 41 shows still another example of the display/operation instruction window;
FIG. 42 shows still another example of the display/operation instruction window;
FIG. 43 shows still another example of the display/operation instruction window;
FIG. 44 shows still another example of the display/operation instruction window;
FIG. 45 shows still another example of the display/operation instruction window;
FIG. 46 is a flow chart of the operations effected for registration;
FIG. 47 is a flow chart of the operations effected for recording from a CD;
FIG. 48 is a flow chart of the operations effected for

acquisition of information corresponding to CD;
FIG. 49 is a flow chart of the operations effected for data write to a display data file;
FIG. 50 is a flow chart of the operations effected for data read from the display data file;
FIG. 51 is a flow chart of the operations effected for generation of filtering package;
FIG. 52 is a flow chart of the operations effected for checkout or check-in;
FIG. 53 is a flow chart of the operations effected for image pasting;
FIG. 54 is a flow chart of the operations effected for image display;
FIG. 55 is a flow chart of the operations effected for combining contents together;
FIG. 56 is a flow chart of the operations effected for dividing a content; and
FIG. 57 is a flow chart of the operations effected when a portable device is connected to the information processor.

Best Mode for Carrying Out the Invention

[0018] In the following description, embodiments in which the present invention is applied to a music data management system will be exemplified with reference to the drawings.

[0019] Referring now to FIG. 1, there is illustrated an embodiment of the music data management system according to the present invention. As shown, the system includes a personal computer 1-1 connected to a network 2 composed of a local area network (LAN), Internet or the like. The personal computer 1-1 receives music data (will be referred to as "content" hereinafter) from EMD (electrical music distribution) servers 4-1 to 4-3 or those read from a CD (compact disc) which will further be described later, converts the music data to a one compressed by a predetermined method (e.g., ATRAC3 (trade mark)), encrypts the data by a method such as DES (Data Encryption Standard), and then records the data.

[0020] Correspondingly to the above content recorded as encrypted, the personal computer 1-1 records a usage rule under which the content should be used. The usage rule data concerns for example simultaneous use of the contents corresponding to the usage rule at three portable devices (also called "PD") 6-1 to 6-3, copy to the portable devices 6-1 to 6-3, move to another personal computer, etc. The usage rule data will further be described later.

[0021] The personal computer 1-1 stores the content recorded therein as encrypted as well as data related to the content such as music title, number of reproduction, reproduction period or equalizer information or the like into the portable device 6-1 connected thereto, and updates the usage rule data for the content having thus been stored into the portable device 6-1 (which will be referred to as "checkout" hereinafter). Also, the personal computer 1-1 stores the content recorded therein as encrypted as well as data related to the content into the portable device 6-2 connected thereto, and updates the usage rule data for the content having thus been stored into the portable device 6-2. Further, the personal computer 1-1 stores the content recorded therein as encrypted as well as data related to the contents into the portable device 6-3 connected thereto, and updates the usage rule data for the content having been thus stored into the portable device 6-3.

[0022] Moreover, the personal computer 1-1 has the portable device 6-1 connected thereto erase the content that the personal computer 1-1 has checked out to the portable device 6-1, and updates the usage rule data for the content having thus been erased (which will be referred to as "check-in" hereinafter). Also, the personal computer 1-1 has the portable device 6-2 connected thereto erase the content that the personal computer 1-1 has checked out to the portable device 6-2, and updates the usage rule data for the content having thus been erased. Further, the personal computer 1-1 has the portable device 6-3 connected thereto erase the content that the personal computer 1-1 has checked out to the portable device 6-3, and updates the usage rule data for the content having thus been erased.

[0023] The personal computer 1-1 cannot check in the content that the personal computer 1-1 has checked out to the portable device 6-1. The personal computer 1-1 cannot check in the content that the personal computer 1-1 has checked out to the portable device 6-2. The personal computer 1-1 cannot check in the content that the personal computer 1-1 has checked out to the portable device 6-3.

[0024] The system includes a personal computer 1-2 connected to a network 2 composed of a local area network (LAN), Internet or the like. The personal computer 1-2 receives a content from the EMD servers 4-1 to 4-3 or those read from a CD which will further be described later, converts the content to a one compressed by a predetermined method, encrypts the data by a method such as DES, and then records the data.

[0025] Correspondingly to the above content recorded as encrypted, the personal computer 1-2 records a usage rule under which the content should be used. The usage rule data concerns for example simultaneous use of the contents corresponding to the usage rule at three portable devices, copy to the portable devices, move to another personal computer, etc. The usage rule data will further be described later.

[0026] The personal computer 1-2 stores the content recorded therein as encrypted as well as data related to the content into the portable device 6-4 connected thereto, and updates the usage rule data for the content having thus been stored into the portable device 6-4, that is, checks out the content. That is, if there is an instruction of checking out of the content, the personal computer 1-2 does not check out the content to the portable device 6-4 when the usage period, the number of

reproduction or the like described later is set to the content.

[0027] Moreover, the personal computer 1-2 has the portable device 6-4 connected thereto erase the content that the personal computer 1-2 has checked out to the portable device 6-4, and updates the usage rule data for the content having thus been erased.

[0028] The personal computer 1-2 cannot check in the content that the personal computer 1-2 has checked out to the portable device 6-4.

[0029] Hereinafter, when there is no need to distinguish between the personal computer 1-1 and the personal computer 1-2, it is merely called the the personal computer 1.

[0030] As shown, the music data management system includes an EMD (electrical music distribution) registration server 3. Upon reception of a request content distribution from the personal computer 1 starting acquisition of a content from the EMD servers 4-1 to 4-3, the EMD registration server 3 sends to the personal computer 1 via the network 2 an authenticate key necessary for mutual authentication between the personal computer 1 and EMD servers 4-1 to 4-3, and also a program required for connection to the EMD servers 4-1 to 4-3.

[0031] Correspondingly to the request from the personal computer 1, the EMD server 4-1 supplies a content as well as data related to the content such as music title, number of reproduction, reproduction period or equalizer information or the like to the personal computer 1 via the network 2. Also the EMD server 4-2 supplies a content to the personal computer 1 via the network 2 correspondingly to that request. Further the EMD server 4-3 supplies a content to the personal computer 1 via the network 2 correspondingly to the request from the personal computer 1.

[0032] The content supplied from the EMD servers 4-1 to 4-3 have been compressed by the same method or different methods, and also encrypted by the same method or different methods.

[0033] As shown, the music data management system further includes WWW (worldwide web) servers 5-1 and 5-2. Correspondingly to the request from the personal computer 1, the WWW server 5-1 supplies to the personal computer 1 via the network 2 data on a CD from which a content has been read (e.g., name of album recorded in the CD, distributor or supplier of the CD and the like) and data (e.g., music title (or content name), composer's name (or artist name) and the like) corresponding to the content having been read from the CD. Also correspondingly to the request from the personal computer 1, the WWW server 5-2 supplies to the personal computer 1 via the network 2 data on a CD from which a content have been read and data corresponding to the content having been read from the CD.

[0034] The portable device 6-1 stores the content supplied from the personal computer 1 (namely, "checked-out content") as well as data related to the content such as music title, number of reproduction, reproduction period or equalizer information or the like. The portable device 6-1 plays back the stored content based on the data related to the content and output them to a headphone or the like (not shown).

[0035] For example, when the content is to be played back more than the number of reproduction stored as the data related to the content, the portable device 6-1 terminates the reproduction of the content. When the content is to be played back after the reproduction period stored as the data related to the content, the portable device 6-1 terminates the reproduction of the content. The portable device 6-1 equalizes the sound based on the equalizer information stored as the data related to the content for output.

[0036] The user can disconnect from the personal computer 1 the portable device 6-1 having the content stored therein, carry it with him or her, and play back the stored content. Thus the user can listen to music pieces or the like corresponding to the content using an electrical acoustic converter such as a headphone or the like.

[0037] Also, the portable device 6-2 stores the content supplied from the personal computer 1 as well as data related to the content. The portable device 6-2 plays back the stored content based on the data related to the content and output them to a headphone or the like (not shown). The user can disconnect from the personal computer 1 the portable device 6-2 having the content stored therein, carry it with him, and play back the stored content. Thus the user can listen to music pieces or the like corresponding to the content using a headphone or the like.

[0038] Also, the portable device 6-3 stores the content supplied from the personal computer 1 as well as data related to the content. The portable device 6-3 plays back the stored content based on the data related to the content and output them to a headphone or the like (not shown). The user can disconnect from the personal computer 1 the portable device 6-3 having the content stored therein, carry it with him, and play back the stored content. Thus the user can listen to music pieces or the like corresponding to the content using a headphone or the like.

[0039] Also, the portable device 6-4 stores the content supplied from the personal computer 1, or the content whose usage period or number of reproduction described later is not set, as well as data related to the content. The portable device 6-4 plays back the stored content based on the data related to the content and output them to a headphone or the like (not shown). The user can disconnect from the personal computer 1 the portable device 6-4 having the content stored therein, carry it with him, and play back the stored content. Thus the user can listen to music pieces or the like corresponding to the content using a headphone or the like.

[0040] The personal computer 1-1 used on the music data management system shown in FIG. 1 has a structure shown in FIG. 2, and a CPU (central processing

unit) 11 comprised in the personal computer 1-1 actually executes a variety of application programs (will be detailed later) and OS (operating system). Also, the personal computer 1 includes a ROM (read-only memory) 12 and a RAM (random-access memory) 13. Generally, the ROM 12 stores programs used by the CPU 11 and basically fixed data of arithmetic parameters. The RAM 13 stores programs executed by the CPU 11 and parameters which will appropriately vary during the execution of the programs.

[0041] These components are connected to each other via a host bus 14 composed of a CPU bus, etc. The host bus 14 is connected to an external bus 16 such as a PCI (peripheral component interconnect/interface) via a bridge 15.

[0042] The personal computer 1 is provided also with a keyboard 18, mouse 19, display unit 20 and an HDD 21. The keyboard 18 is operated by the user to input a variety of commands to the CPU 11. The mouse 19 is also operated by the user for pointing and selection on the screen of the display unit 20. The display 20 is an LCD (liquid crystal display) unit or a CRT (cathode ray tube) display unit to display a variety of information as a text or image. The HDD (hard disc drive) 21 drives a hard disc or hard discs to write or read a program executed by the CPU 11 and information to or from the hard disc.

[0043] Further the personal computer 1 is provided with a drive 22 to read data or program recorded in a magnetic disc 41, optical disc 42 (including CD), magneto-optical disc 43 or semiconductor memory 44 set in the drive 22, and supply it to the RAM 13 connected via an interface 17, external bridge 16, bridge 15 and host bus 14 to the drive 22.

[0044] Moreover the personal computer 1 is provided with USB (universal serial bus) ports 23-1 to 23-3, The portable device 6-1 is connected to the USB port 23-1 via a predetermined cable. The USB port 23-1 delivers to the portable device 6-1 the data (e.g., content or command to the portable device 6-1) supplied from the HDD 21, CPU 11 or RAM 13 via the interface 17, external bus 16, bridge 15 or host bus 14.

[0045] To the USB port 23-2, there is the portable device 6-2 via a predetermined cable. The USB port 23-2 delivers to the portable device 6-2 the data (e.g., content or command to the portable device 6-2) supplied from the HDD 21, CPU 11 or RAM 13 via the interface 17, external bus 16, bridge 15 or host bus 14.

[0046] The USB port 23-3 has the portable device 6-3 connected thereto via a predetermined cable. The USB port 23-3 delivers to the portable device 6-3 the data (e.g., content or command to the portable device 6-3) supplied from the HDD 21, CPU 11 or RAM 13 via the interface 17, external bus 16, bridge 15 or host bus 14.

[0047] The personal computer 1 is further provided with a speaker 24 which outputs a predetermined sound corresponding to a content based on data or sound signal supplied from the interface 17.

[0048] As shown, the above components from the keyboard 18 to speaker 24 are connected to the interface 17 which is connected to the CPU 11 via the external bus 16, bridge 15 and host bus 14.

[0049] Further the personal computer 1 is provided with a communications unit 25 to which the network 2 is connected. The communications unit 25 stores in the form of a predetermined packet data supplied from the CPU 11 or HDD 21 (e.g., request for registration, request for sending of a content or the like), and sends the data via the network 2, and outputs data stored in the received packet (e.g., authenticate key, content or the like) to the CPU 11, RAM 13 or HDD 21 via the network 2.

[0050] The communications unit 25 is connected to the CPU 11 via the external bus 16, bridge 15 and hist bus 14.

[0051] As the other personal computer 1-2 has a similar structure to that of the personal computer 1-1, the explanation is omitted.

[0052] Referring now to FIG. 3, there is shown the configuration of the EMD registration server 3. As shown, the EMD registration server 3 includes a CPU 61, ROM 62 and a RAM 63. The CPU 61 actually executes a variety of application programs and OS. Generally, the ROM 62 stores programs used by the CPU 61 and basically fixed data of arithmetic parameters. The RAM 63 stores programs executed by the CPU 61 and parameters which will appropriately vary during the execution of the programs. These components are connected to each other via a host bus 64 composed of a CPU bus, etc.

[0053] The host bus 64 is connected to an external bus 66 such as a PCI bus via a bridge 65.

[0054] The EMD registration server 3 is provided also with a keyboard 68, mouse 69, display unit 70 and an HDD 71. The keyboard 68 is operated by the user to input a variety of commands to the CPU 61. The mouse 69 is also operated by the user for pointing and selection on the screen of the display unit 70. The display 70 is an LCD unit or a CRT display unit to display a variety of information as a text or image. The HDD 71 drives a hard disc or hard discs to write or read a program executed by the CPU 61 and information to or from the hard disc.

[0055] Further the EMD registration server 3 is provided with a drive 72 to read data or program recorded in a magnetic disc 91, optical disc 92, magneto-optical disc 93 or semiconductor memory 94 set in the drive 72, and supply it to the RAM 63 connected via an interface 67, external bus 66, bridge 65 and host bus 64 to the drive 72.

[0056] As shown, the above components from the keyboard 68 to drive 72 are connected to the interface 67 which is connected to the CPU 61 via the external bus bridge 65 and host bus 64.

[0057] Further the EMD registration server 3 is provided with a communications unit 73 to which the net-

work 2 is connected. The communications unit 73 outputs data stored in the received packet to the CPU 61, RAM 63 or HDD 71 (e.g., data required for registration which will further be described later, predetermined program ID (identifier) or the like), and stores data supplied from the CPU 61 or HDD 71 (e.g., a predetermined number of authenticate keys, program or the like) in the form of a predetermined packet for sending via the network 2.

[0058] The communications unit 73 is connected to the CPU 61 via the external bus 66, bridge 65 and hist bus 64.

[0059] The EMD servers 4-1 to 4-3 and WWW servers 5-1 and 5-2 are constructed similarly to the EMD registration server 3. Therefore, they will not be described any further.

[0060] Next, functions the personal computer 1 can perform by executing predetermined programs will be described herebelow:

[0061] Referring now to FIG. 4, there are shown in the form of a block diagram the functions of the personal computer 1, which can be performed by CPU 11 executing predetermined programs.

[0062] The CPU 11 executes a content management program 111 composed of a plurality of programs including an EMD selection program 131, check-in/checkout management program 132, encryption method conversion program 133, compression method conversion program 134, encryption program 135, usage rule conversion program 136, signature management program 137, authentication program 138, decryption program 139, PD driver 140, and purchase drivers 141 and 142.

[0063] The content management program 111 is stated with shuffled instructions, encrypted instructions or the like for example to conceal what are to be done under such instructions. Namely, it is difficult to know what is to be effected according to the content management program 111. For example, even if the content management program 111 is read directly by the user, no instructions included in the program 111 will not be identifiable.

[0064] When the content management program 111 is installed in the personal computer 1, the EMD selection program 131 will not be included in the content management program 111 but will be received from the EMD registration server 3 via the network 2 during EMD registration which will further be described later. The EMD selection program 131 is to select connection with any of the EMD servers 4-1 to 4-3 and have a purchase application program 115 or the purchase driver 141 or 142 communicate with any of the EMD servers 4-1 to 4-3 (for example, downloading of a content to be purchased or the like).

[0065] The check-in/checkout management program 132 is to set either check-in or checkout, and check out contents stored in content files 161-1 to 161-N to any of the portable devices 6-1 to 6-3 based on usage rule files 162-1 to 162-N recorded in a content data base 114 or check in contents stored in the portable devices 6-1 to 6-3.

[0066] Correspondingly to either. the check-in or checkout set as in the above, the check-in/checkout management program 132 updates usage rule data stored in the usage rule files 162-1 to 162-N recorded in the content data base 114.

[0067] The encryption method conversion program 133 is to convert an encryption method having been used to encrypt a content the purchase application program 115 has received from the EMD server 4-1 via the network 2, a one having been used to encrypt a content the purchase driver 141 has received from the EMD server 4-2 via the network 2 or a one having been used to encrypt a content the purchase driver 142 has received from the EMD server 4-3 via the network 2, to the same encryption method as that having been used to encrypt contents stored in the content files 161-1 to 161-N the content data base 114 have recorded therein.

[0068] Also, when checking out a content to the portable device 6-1 or 6-3, the encryption method conversion program 133 is used to convert an encryption method by which a content to be checked out to a one the portable device 6-1 or 6-3 can use.

[0069] The compression method conversion program 134 is to convert a compression method having been used to compress a content the purchase application program 115 has received from the EMD server 4-1 via the network 2, a one having been used to compress a content the purchase driver 141 has received from the EMD server 4-2 via the network 2 or a one having been used to compress a content the purchase driver 142 has received from the EMD server 4-3 via the network 2, to the same compression method as that having been used to compress contents stored in the content files 161-1 to 161-N the content data base 114 having recorded therein.

[0070] The compression method conversion program 134 is read e.g. from a CD, and encodes the uncompressed contents supplied from the recording program 113 by the same encoding method as one of the contents stored in the content files 161-1 to 161-N the content data base 114 having recorded therein.

[0071] Also, when checking out a content to the portable device 6-1 or 6-3, the compression method conversion program 134 is used to convert the compression method having been used to compress the content to be checked out to a one the portable device 6-1 or 6-3 can use.

[0072] The encryption program 135 is to encrypt a content having been read from a CD for example and supplied from a recording program 113 (not yet encrypted) by the encryption method having been used to encrypt contents stored in the content files 161-1 to 161-N recorded in the content data base 114.

[0073] The usage rule conversion program 136 is to convert the usage rule data for content the purchase application program 115, purchase driver 141 or purchase driver 142 has received from the EMD server 4-1, 4-2

or 4-2, respectively, via the network 2, to the same format as that of the usage rule data stored in the usage rule files 161-1 to 161-N recorded in the content data base 114.

[0074] Also, when checking out a content to the portable device 6-1 or 6-3, the usage rule conversion program 136 converts the usage rule for the content to be checked out to a usage rule data the portable device 6-1 or 6-3 can use.

[0075] The signature management program 137 is to find, before check-in or checkout of a content, any falsification of the usage rule based on a signature (will further be described later) included in the usage rule data stored in the usage rule files 162-1 to 162-N recorded in the content data base 114, and updates the signature included in the usage rule data correspondingly to an update of the usage rule data stored in the usage rule files 162-1 to 162-N recorded in the content data base 114, the update having occurred after the check-in or checkout of the content.

[0076] The authentication program 138 is to provide a mutual authentication between the content management program 111 and purchase application program 115, and a mutual authentication between the content management program 111 and purchase driver 141. Also, the authentication program 138 stores authenticate keys for use in a mutual authentication between the EMD server 4-1 and purchase application program 115, a mutual authentication between the EMD server 4-1 and purchase driver 141, and a mutual authentication between the EMD server 4-3 and purchase driver 142.

[0077] The authenticate key used by authentication program 138 for the mutual authentication has not yet been stored in the authentication program 138 when the content management program 111 is installed in the personal computer 1 but it will be supplied from the EMD registration server 3 and stored in the authentication program 138 when a registration has successfully been done by a display/operation instruction program 112.

[0078] When the personal computer 1 reproduces contents stored in the content files 161-1 to 161-N recorded in the content data base 114, the decryption program 139 is to decrypt the content.

[0079] When checking out a predetermined content to the portable device 6-2 or checking in a predetermined content from the portable device 6-2, the PD driver 140 is to supply the portable device 6-2 with the content or a command to have the portable device 6-2 execute a predetermined operation.

[0080] When checking out a predetermined content to the portable device 6-1 or checking in a predetermined content from the portable device 6-1, the PD driver 140 is to supply a device driver 116-1 with the content or a command to have the device driver 116-1 execute a predetermined operation.

[0081] When checking out a predetermined content to the portable device 6-3 or checking in a predetermined content from the portable device 6-3, the PD driver 140 is to supply a device driver 116-2 with the content or a command to have the device driver 116-2 execute a predetermined operation.

[0082] The purchase driver 141 is a so-called plug-in program. It is installed along with the content management program 111, and supplied from the EMD registration server 3 via the network 2 or as recorded in a predetermined CD. Installed in the personal computer 1, the purchase driver 141 is to send and receive data to and from the content management program 111 via an interface of a predetermined type the content management program 111 has.

[0083] The purchase driver 141 sends to the EMD server 4-2 via the network 2 a request for sending a predetermined content, and receives the content from the EMD server 4-2. Also, the purchase driver 141 makes an accounting when receiving a content from the EMD server 4-2.

[0084] The purchase driver 142 is a program which is to be installed along with the content management program 111. It is to send to the EMD server 4-3 via the network 2 a request for sending a predetermined content, and receives the content from the EMD server 4-3. Also, the purchase driver 142 makes an accounting when receiving a content from the EMD server 4-3.

[0085] The display/operation instruction program 112 is to have the display unit 20 display a predetermined window image based on a filtering data file 181, display data file 182, image files 183-1 to 183-K or history data file 184, and instruct the content management program 111 by means of the keyboard 18 or mouse 19 to check in or out a content.

[0086] The filtering data file 181 has stored therein data for weighting each of contents stored in the content files 161-1 to 161-N recorded in the content data base 114, and it is recorded in the HDD 21.

[0087] The display data file 182 has stored therein data corresponding to contents stored in the content files 161-1 to 161-N recorded in the content data base 114, and it is recorded in the HDD 21.

[0088] The image files 183-1 to 183-K have stored therein images corresponding to the content files 161-1 to 161-N recorded in the content data base 114 or images corresponding to packages which will further be described later, and they are recorded in the HDD 21.

[0089] In the following, the image files 183-1 to 183-K will be referred to simply as "image file 183" where it is not necessary to identify them individually.

[0090] The history data file 184 has stored therein history data including numbers of times contents stored in the content files 161-1 to 161-N recorded in the content data base 114 have been checked out, numbers of times the contents stored in the content files 161-1 to 161-N have been checked in, dates of the check-in and checkout, etc., and it is recorded in the HDD 21.

[0091] For the registration, the display/operation instruction program 112 is to send a previously stored ID of the content management program 111 to the EMD

registration server 3 via the network 2 while receiving an authenticate key and EMD selection program 131 from the EMD registration server 3, and supplies the content management program 111 with the authenticate key and EMD selection program 131.

[0092] The recording program 113 is to read out data such as a data recording time, etc. from a CD which is the optical disc 42 set in the drive 22 based on an operation made to the keyboard 18 or mouse 19, while displaying a predetermined window image.

[0093] The recording program 113 requests, via the network 2, for sending to the WWW server 5-1 or 5-2 of data corresponding to a CD (e.g., album name, artist name and the like) or data corresponding to contents recorded in the CD (e.g., content names and the like) based on the content recording time recorded in the CD while receiving, from the WWW server 5-1 or 5-2 data corresponding to a CD or data corresponding to contents recorded in the CD.

[0094] The recording program 113 is to supply received data corresponding to a CD or data corresponding to contents recorded in the CD to the display/operation instruction program 112.

[0095] When supplied with a recording instruction, the recording program 113 reads out contents from a CD being the optical disc 42 set in the drive 22 and outputs it as well as the usage rule data corresponding to the content such as No. of maximum possible checkouts to the content management program 111.

[0096] The content data base 114 stores in any of the content files 161-1 to 161-N contents supplied from the content management program 111, compressed by a predetermined method and encrypted by a predetermined method (namely, they are recorded in the HDD 21). The content data base 114 stores in any of the usage rule files 162-1 to 162-N corresponding to the content files 161-1 to 161-N, respectively, having contents stored therein usage rule data corresponding to the contents stored in the content files 161-1 to 161-N, respectively (namely, they are recorded in the HDD 21).

[0097] The content data base 114 may have stored therein the content files 161-1 to 161-N or usage rule files 162-1 to 162-N as records.

[0098] For example, usage rule data corresponding to a content stored in the content file 161-1 is stored in the usage rule file 162-1. Also, usage rule data corresponding to a content stored in the content file 161-N is stored in the usage file 162-N.

[0099] A starting program 117 is, so to speak, a resident program which is continuously operating while the operating system of the personal computer 1-1 is operating, and starts the display/operation instruction program 112 when it is not started if the starting program 117 receives from the device driver 116-2 a signal meaning the portable device 6-1 has been connected to the USB port 23-1.

[0100] Also, the starting program 117 starts the display/operation instruction program 112 when it is not started if the starting program 117 receives from the device driver 116-2 a signal meaning the portable device 6-3 has been connected to the USB port 23-3.

[0101] When the display/operation instruction program 112 is started by the starting program 117 as the portable device 6-1 is connected to the USB port 23-1, or as the portable device 6-3 is connected to the USB port 23-3, the display/operation instruction program 112 reads out from the portable device 6-1 or 6-3 data related to the content, such as music title, playing time and the like, recorded in the portable device 6-1 or 6-3 to display them on a predetermined window described later.

[0102] Further, when the display/operation instruction program 112 is started by the starting program 117 as the portable device 6-1 is connected to the USB port 23-1, or as the portable device 6-3 is connected to the USB port 23-3, the display/operation instruction program 112 checks in the content, that is limited to the content checked out from the personal computer 1-1, from the portable device 6-1 or 6-3 connected, selects the content based on a predetermined setting, and checks out the selected content to the portable device 6-1 or 6-3, if the predetermined setting is set to the display/operation instruction program 112.

[0103] In the following, the content files 161-1 to 161-N will be referred to simply as "content file 161" where it is not necessary to identify them individually. Also, in the following, the usage rule files 162-1 to 162-N will be referred to simply as "usage rule file 162" where it is not necessary to identify them individually.

[0104] As the function of the other personal computer 1-2 is similar to that of the personal computer 1-1 described above, the explanation is omitted.

[0105] Referring now to FIG. 5, there is shown an example of usage rule data stored in the usage rule files 162-1 to 162-N. For the item "Content ID", there is set data to identify a content stored in each of the content files 161-1 to 161-N. For the item "checkout Possible? ", there is set either "YES" or "NO". When "YES" is set for this item, the content management program 111 can check out a content identified with the "Content ID" to any of the portable devices 6-1 to 6-3. When "NO" is set for the item "Checkout Possible?", the content management program 111 will not check out the content identified with the "Content ID" to any of the portable devices 6-1 to 6-3.

[0106] For the item "No. of Maximum Possible Checkouts", there is set a maximum number of times the content management program 111 can check out either the corresponding content file 161-1 or 161-N. The number of maximum possible checkouts will not be changed.

[0107] For the item "No. of Possible Checkouts", there is set a number of times the content management program 111 can check out either the corresponding content file 161-1 or 161-N at the time. When the content management program 111 checks out a content once, the number for the item "No. of Possible Checkouts" is

decremented correspondingly. When the content management program 111 checks in a content once, the number for the item "No. of Possible Checkouts" is incremented correspondingly.

[0108] When neither the corresponding content file 161-1 nor 161-N is checked out, a value equal to the number of maximum possible checkouts is set as the corresponding number of possible checkouts.

[0109] When the number for the item "No. of Possible Checkouts" changes from "1" to "0" as the result of the checkouts done by the content management program 111, there will be set "NO" for the item "Checkout Possible?". When the number for the item "No. of Possible Checkouts" changes from "0" to "1" as the result of the check-in's done by the content management program 111, there will be set "YES" for the item "Checkout Possible?".

[0110] In the item "Move Possible?", there is set either "YES" or "NO". When "YES" is set for this item, the content management program 111 can move a content identified with the "Content ID". When "NO" is set for the item "Move Possible", the content management program 111 will not move the content identified with the "Content ID".

[0111] In the item "Copy Possible?", there is set either "YES" or "NO". When "YES" is set for this item, the content management program 111 can copy a content identified with the "Content ID". When "NO" is set for this item, the content management program 111 will not copy the content identified with the "Content ID".

[0112] In the item "Number of Possible Copies", there is set a number of times the content management program 111 can effect content copy.

[0113] In the item "Usage Period", there is stated a period for which a content identified with the "Content ID" can be used (checkout or playback).

[0114] In the item "Content-Usable District", there is stated a district (e.g., Japan or Worldwide) where a content identified with the "Content ID" can be used (checkout or playback).

[0115] In the item "Signature", there is stored data (will be referred to as "signature data" hereinafter) the signature management program 137 generates based on data set in the items "Content ID" to "Content-Usable District". The signature data is used for detection of any falsification of usage rule data. The algorithm used by the signature management program 137 for generation of signature data is a unidirectional function. Since it is not disclosed to the public, it is difficult for any other than the supplier of the content management program 111 to generate a correct signature data based on data set in the items "Content ID" to "Content-Usable District".

[0116] The purchase application program 115 is supplied from the EMD registration server 3 via the network 2 or as recorded in a predetermined CD. The purchase application program 115 is to request the EMD server 4-1 for sending a predetermined content, receives the content from the EMD server 4-1 and supplies it to the content management program 111. Also, the purchase management program 115 makes an accounting when receiving the content from the EMD server 4-1.

[0117] Next, correspondence between data stored in the display data file 82 and the content files 161-1 to 161-N stored in the content data base will be described:

[0118] A content stored in any of the content files 161-1 to 161-N belongs to a predetermined package. In detail, the package is an original package, My select package or a filtering package.

[0119] More than one content belong to the original package. The original package corresponds to the content classification in the EMD servers 4-1 to 4-3 (e.g., so-called album) or to a single CD. The contents belong to any original package and cannot belong to a plurality of original packages. The original package to which the contents belong cannot be modified. The user can edit (addition of information or modification of added information) a part of information corresponding to the original package.

[0120] Referring now to FIG. 6, there is shown an example of the relation between the original package display data 201 included in a display data file 182 and content files 161-1 to 161-N. The relation defines the relation between an original package and contents. The original package display data 201 includes package display data 221-1 to 221-M.

[0121] The package display data 211-1 is related with the content display data 221-1-1 to 221-1-i.

[0122] The content display data 221-1-1 corresponds to a content stored in the content file 161-1. Usage rule data for a content stored in the content file 161-1 is stored in the usage rule 162-1.

[0123] The content display data 221-1-2 corresponds to a content stored in the content file 161-2. Usage rule data for a content stored in the content file 161-2 is stored in the usage rule 162-2.

[0124] The content display data 221-1-i corresponds to a content stored in the content file 161-q. Usage rule data for a content stored in the content file 161-q is stored in the usage rule 162-q.

[0125] The package display data 211-2 are related with the content display data 221-2-1 to 221-2-j.

[0126] The content display data 221-2-1 corresponds to a content stored in the content file 161-(q+1). Usage rule data for a content stored in the content file 161-(q+1) is stored in the usage rule 162-(q+1).

[0127] The content display data 221-2-2 corresponds to a content stored in the content file 161-(q+2). Usage rule data for a content stored in the content file 161-(q+2) is stored in the usage rule 162-(q+2).

[0128] The content display data 221-2-j corresponds to a content stored in the content file 161-r. Usage rule data for a content stored in the content file 161-r is stored in the usage rule 162-r.

[0129] Similarly, the package display data 211-M are related with the content display data 221-M-1 to 221-M-p.

[0130] The content display data 221-M-p corresponds to a content stored in the content file 161-N. Usage rule data for a content stored in the content file 161-N is stored in the usage rule 162-N.

[0131] In the following, the package display data 211-1 to 211-M will be referred to simply as "package display data 211" where it is not necessary to identify them individually. Also, the content display data 221-1-1 to 221-M-p will be referred to simply as "content display data 221" where it is not necessary to identify them individually. Also, the content display data 161-1 to 161-N will be referred to simply as "content display data 161" where it is not necessary to identify them individually. The usage rule files 162-1 to 162-N will be referred to simple as "usage rule file 162" where it is not necessary to identify them individually.

[0132] Referring now to FIGS. 7A to 7C, there is shown an example of the composition of the display data file 182. FIG. 7A shows an example of the original package display data 201. The original package display data 201 corresponds to a main table which stores display data corresponding to the package of the display data file 182, and includes package ID data for identification of a package, package type data for identification of either My Select package or filtering package, data of a package source in which a name of any one of the EMD servers 4-1 to 4-3 or a CD is set, package name data, artist name data, genre name data, content ID data indicating name of image file in which an image corresponding to a package is stored, and content ID data corresponding to more than one content belonging to a package.

[0133] Information corresponding to an original package added by the user is added to the main table or a sub table not shown.

[0134] FIG. 7B shows an example of the content display data 221. The content display data 221 corresponds to a main table of the display data file 182 which stores display data corresponding to the content, and includes content ID data, original package ID data for identification of an original package to which a corresponding package belong, content name data, data on number of checkouts, data on maximum number of checkouts, and data for indicating name of image file in which an image corresponding to a content is stored.

[0135] Further, the display data file 182 may be made to correspond to a content ID and have data type and data recorded in the sub table, as shown in FIG. 7C. In the sub table are recorded data and the data type which is different from that of the main table, corresponding to each content ID per a record.

[0136] For example, in the sub table of the display data file 182 shown in FIG. 7C are recorded a cyber code (trademark), an ISRC (International Standard Recording Code), a songwriter name and a composer name corresponding to the content whose content ID is 123xDES3. Also, in the sub table of the content display data 221 shown in FIG. 7C are recorded a cyber code (trademark), an ISRC, a reproduction period and number of reproduction corresponding to the content whose content ID is 123xDES4.

[0137] Meanwhile, in the sub table of the display data file 182 may be recorded data and the data type which is different from that of the main table of the package, corresponding to each package ID.

[0138] Accordingly, by using the sub table, even if a new type of data corresponding to the content is added, the display data file 182 can record the data of the new type smoothly and promptly without changing the system of the main table.

[0139] The My Select package has belonging thereto more than one content freely selected by the user. The user can freely make an edition to have a content belong to a My Select package. A content may belong to more than one My Select package, and may not belong to any My Select package.

[0140] Referring now to FIG. 8, there is shown an example of the relation between the My Select package display data 241 belonging to the display data file 182 and content files 161-1 to 161-N. The relation defines the relation between a My Select package and contents. The My Select package display data 241 includes package display data 251-1 to 251-S.

[0141] The package display data 251-1 is related with the content display data 221-1-1 221-2-2 or 221-1-i correspondingly to a setting made by the user.

[0142] The package display data 251-2 is related with the content display data 221-2-j 221-3-1 or 221-1-2 correspondingly to a setting made by the user.

[0143] Similarly, the package display data 251-S is related with the content display data 221-2-2 or 221-1-i correspondingly to a setting made by the user.

[0144] In the following, the package display data 251-1 to 251-S will be referred to simply as "package display data 251" where it is not necessary to identify them individually.

[0145] Since the package display data 251 has a similar composition to that of the package display data 221 having been previously described with reference to FIG. 7A, so it will not be described any further.

[0146] Thus, the user can have a desired content belong to a My Select package. One content belongs to a plurality of My Select packages as the case may be.

[0147] The filtering package has belonging thereto a content selected based on filtering data stored in the filtering data file 181. The filtering data is supplied from the EMD servers 4-1 to 4-3 or WWW server 5-1 or 5-2 via the network 2, or as recorded in a predetermined CD. The user may edit filtering data stored in the filtering file 181.

[0148] The filtering data is a reference for selection of a predetermined content or calculation of a weight corresponding to a content. For example, using the filtering data corresponding to the J-POP (Japanese pops) of the week, the personal computer 1 can identify ten contents from the best to tenth-place ones of the week.

[0149] The filtering data file 181 includes for example filtering data for selection of contents in the descending order of the periods for which they have been checked out for the past one month, filtering data for selection of contents having been checked out frequently for the past half year or filtering data for selection of contents including a letter "love" in their name.

[0150] Thus, a content in the filtering package is selected by relating the content display data 221 corresponding to the content (including data set by the user in the content display data 221) or history data 184 with a filtering data.

[0151] Referring now to FIG. 9, there is shown an example of the relation between the filtering package display data 281 belonging to the display data file 182 and content files 161-1 to 161-N. The relation defines the relation between a My Select package and contents. The filtering package display data 281 includes package display data 291-1 to 291-A.

[0152] The package display data 291-1 is related with the content display data 221-2-1, 221-1-2 or 221-M-p.

[0153] The package display data 291-2 is related with the content display data 221-1-i, 221-2-j and 221-2-2.

[0154] Similarly, the package display data 291-A is related with the content display data 221-1-i, 221-2-j and 221-2-2.

[0155] In the following, the package display data 291-1 to 291-A will be referred to simply as "package display data 291" where it is not necessary to identify them individually.

[0156] Since the package display data 291 has a similar composition to that of the package display data 221 having been previously described with reference to FIG. 7A, so it will not be described any further.

[0157] Thus, a predetermined content selected by the user operating the personal computer 1 belongs to the filtering package, and one content belongs to a plurality of filtering packages as the case may be.

[0158] Next, EMD registration will be described with reference to FIG. 10. When the display/operation instruction program 112 is initially started with the content management program 111 and display/operation instruction program 112 installed in the personal computer 1, it references to a uniform resource locator (URL) and the like previously stored therein, and connects to the EMD registration server 3 via the network 2.

[0159] The EMD registration server 3 sends data for display of a screen intended for the registration to the display/operation instruction program 112. The display/operation instruction program 112 will display a screen having an EMD registration button 311 disposed thereon on the display unit 20 as shown in FIG. 11 for example.

[0160] When the EMD registration button 311 is clicked, the display/operation instruction program 112 requests the EMD registration server 3 for sending an authenticate key 301 and EMD selection program 131 previously recorded in the EMD registration server 3 along with a previously stored ID for the content management program 111 and necessary data for the registration (e.g., name of the user of the personal computer 1 and credit No.).

[0161] When it is determined that the received ID for the content management program 111 is valid, the EMD registration server 3 sends the authenticate key 301 and EMD selection program 131 to the display/operation instruction program 112 via the network 2.

[0162] On the contrary, when it is determined that the received ID for the content management program 111 is invalid, the EMD registration server 3 will send a predetermined error message to the display/operation instruction program 112 via the network 2. When the ID for the content management program 111 is not invalid, the display/operation instruction program 112 cannot acquire the authenticate key 301 and EMD selection program 131.

[0163] Upon reception of the authenticate key 301 and EMD selection program 131 from the EMD registration server 3, the display/operation instruction program 112 will supply the authenticate key 301 and EMD selection program 131 to the content management program 111.

[0164] When supplied with the authenticate key 301 and EMD selection program 131 from the display/operation instruction program 112, the content management program 111 will install and start the EMD selection program 131, and supply the authenticate key 301 to the authentication program 138. The authentication program 138 stores therein the acquired authenticate key 301.

[0165] After started, the EMD selection program 131 will display, on the display unit 20, a window having disposed therein buttons for starting the connection with any of the EMD servers 4-1 to 4-3 as shown in FIG. 12 for example.

[0166] When an EXA-SOFT AUDIO button 331 for example is clicked, the content management program 111 starts a purchase application 151 and connects the purchase application 151 to the EMD server 4-1. At this time, the authentication program 138 uses the authenticate key 301 to execute a mutual authentication with the purchase application 151 and has the purchase application 151 make a mutual authentication with the EMD server 4-1.

[0167] When the purchase application 151 has successfully made the mutual authentication with the EMD server 4-1, it will display, on the display unit 20, a screen for purchase of a content as shown in FIG. 13 for example.

[0168] When an AQUA AUDIO button 332 for example, shown in FIG. 12, is clicked, the content management program 111 will install the purchase driver 141 being a plug-in program, and connect the purchase driver 141 to the EMD server 4-2. At this time, the authentication program 138 uses the authenticate key 301 to execute a mutual authentication with the purchase driv-

er 141 and has the purchase driver 141 make a mutual authentication with the EMD server 4-2.

[0169] When the purchase driver 141 has succeeded in the mutual authentication with the EMD server 4-2, it will display, on the display unit 20, a screen for purchase of a content as shown in FIG. 14 for example.

[0170] Similarly, when a DMD button 333 for example, shown in FIG. 12, is clicked, the content management program 111 will connect the purchase driver 142 to the EMD server 4-3. At this time, the authentication program 138 uses the authenticate key 301 to execute a mutual authentication with the EMD server 4-3 via the purchase driver 142.

[0171] Note that when a check button 334 (DIRECT CHECKOUT) shown in FIG. 12 is checked, a content received from any of the EMD servers 4-1 to 4-3 (namely, the content is purchased) is stored into the content data base 114 and checked out to any predetermined one of the portable devices 6-1 to 6-3.

[0172] Next, reading of a content from a CD set in the drive 22 and recording of the content will be described.

[0173] Referring now to FIG. 15, there is shown an example of the display/operation instruction window the display/operation instruction program 112 displays on the display unit 20 when it is started after completion of the EMD registration.

[0174] The display/operation instruction window has disposed therein a button 341 for starting the recording program 113, button 342 for starting the EMD selection program 131, button 343 for displaying a field in which check-in or checkout is set, and a button 344 for displaying a field for edition of a My Select package, that is, the My Select package display data 241.

[0175] When a button 345 also disposed is selected, data corresponding to an original package is displayed in a field 351. When a button 346 also disposed is selected, data corresponding to a My Select package is displayed in the field 351. When a button 347 also disposed is selected, data corresponding to a filtering package is displayed in the field 351.

[0176] Data displayed in the field 351 relates to a package, and it is for example a package name or artist name.

[0177] As shown in FIG. 15, in the field 351, there are shown, for example, a package name "FIRST" and artist name "A. TARO" stored in the package display data 221-1, a package name "SECOND" and artist name "A. TARO" stored in the package display data 221-2, etc.

[0178] In a field 352, there is shown data corresponding to contents belonging to packages selected in the field 351. Data displayed in this field 352 include content name, play time or number of possible checkouts, etc., for example.

[0179] In FIG. 15 for example, since a package corresponding to the package display data 221-2 is selected, there are displayed in the field 351 a content name "MINAMI-NO-SAKABA" and number of possible checkouts "..." (indicating three checkouts) stored in the content display data 221-1 corresponding to contents belonging to a package corresponding to the package display data 221-2, a content name "KITA-NO-HAKABA" and number of possible checkouts ".." (indicating two checkouts" stored in the content display data 221-2, etc.

[0180] One eighth note as the number of possible checkouts displayed in the filed 352 indicates that the corresponding content can check out once.

[0181] A rest note as the number of possible checkouts displayed in the filed 352 indicates that the corresponding content cannot check out, that is, the number of possible checkouts is zero. Also, a treble clef as the number of possible checkouts displayed in the filed 352 indicates that there is no limit in the number of possible checkouts of the corresponding content, that is, the corresponding content can check out with no limit.

[0182] Note that the number of possible checkouts may not only be indicated with a number of predetermined figures (e.g., star, moon or the like) as shown in FIG. 15 but also with a numeral or the likes.

[0183] Also the display/operation instruction window has disposed therein a field 348 in which an image or the like corresponding to a selected package or content is displayed, and a button 349 for use to play back a selected content (output a sound corresponding to the content from the speaker 24). To play back the selected content, the button 349 is to be clicked.

[0184] By selecting a predetermined content name displayed in the field 352 and making an erasing operation while data corresponding to the original package are being displayed in the field 351 with the button 345 activated, the display/operation instruction program 112 will have the content management program 111 erase a predetermined content stored in the content data base 114 and corresponding to the selected content name.

[0185] Referring now to FIG. 16, there is shown, for explanation, a window the recording program 113 has the display unit 20 display when it is started by clicking the button 341.

[0186] The recording program 113 reads a play time of a content from a CD set in the drive 22, and displays it in a field 383. Since the name of the content is unknown, the recording program 113 will display "UNKNOWN" in a part of the field 383 in which a content name is to be displayed.

[0187] Since both he title of the CD set in the drive 22 and artist name are unknown, the recording program 113 will display "UNKNOWN" in each of a field 381 in which a CD title is to be displayed and a field 382 in which an artist name is to be displayed.

[0188] The window displayed on the display unit 20 by the recording program 113 has further disposed therein a button 384 which is to be clicked for acquisition of information from a CD, and a button 385 for setting whether or not a content read from the CD should automatically be checked out to any of the portable devices 6-1 to 6-3 when the read content is recorded into the content data base 114.

[0189] When the button 385 for example is clicked, the recording program 113 will have the display unit 20 display a pulldown menu showing the list of portable devices 6-1 to 6-3. When the user selects any of the portable devices 6-1 to 6-3 from the pulldown menu, the personal computer 1 will automatically check out a content recorded from the CD for any selected one of the portable devices 6-1 to 6-3. When the user selects "NO CHECKOUT" from the pulldown menu, the personal computer 1 will not check out any content recorded from the CD.

[0190] The window the recording program 113 has the display unit 20display has also disposed therein a button 386 for instructing the start of recording of a content recorded in the CD.

[0191] Referring now to FIG. 17, there is shown a property dialog box the recording program 113 has the display unit 20 display when CD information is to be acquired from either of the WWW servers 5-1 and 5-2 and where it is set from which of the WWW servers 5-1 and 5-2 the CD information should be acquired.

[0192] The property dialog box has disposed therein a field 401 where it is set from which of the WWW servers 5-1 and 5-2 the CD information should be acquired. When "CDDB" for example is set in the field 401, the recording program 113 will request the WWW server 5-1 for sending the CD information. When "CDNEW JAPAN" (for example, the name of a company or site providing a similar service to that provided by the CDNEW (trademark)) is set in the field 401, the recording program 113 will request the WWW server 5-2 corresponding to CDDB for sending the CD information.

[0193] When "CDDB" is set in the field 401, fields 402 and 403 will be ready for such a setting. URL at the first site of CDDB is to be set in the field 402 while that at the second site of CDDB is to be set in the field 403.

[0194] When the CD information is received from either of the WWW servers 5-1 and 5-2, there will be set in a field 404 a directory in which the received information is to be recorded (any directory of the HDD 21).

[0195] When a button 405 also disposed in the property dialog box is clicked, the recording program 113 will access, via the network 2, a predetermined one of the WWW servers based on URL previously stored in the recording program 113, acquire information on URL at the first site of CDDB and URL at the second site of CDDB, and set the information on URL at the first site of CDDB as candidate information to be set in the field 402 while setting the information on URL at the second site of CDDB as candidate information to be set in the field 403, as shown in FIG. 18.

[0196] When the button 384 shown in FIG. 16 is clicked after the user sets "CDDB" in the field 401, URL at the first site of CDDB in the field 402 and URL at the second site of CDDB in the field 403 as shown in FIG. 19, the recording program 113 will connect to the WWW server 5-1 based on URL set in the field 402 and URL set in the field 403, request the WWW server 5-1 for CD information by following a procedure corresponding to "CDDB" set in the field 401, and receive the CD information from the WWW server 5-1.

[0197] Referring now to FIG. 20, there is shown a window the recording program 113 has the display unit 20 display when it has received the CD information from the WWW server 5-1 with the button 384 clicked. Based on the CD information received from the WWW server 5-1, the recording program 113 will display a CD title such as "Asynchronized" for example in the field 381, and also an artist name such as "KUWAI" for example in the field 382.

[0198] Based on the CD information received from the WWW server 5-1, the recording program 113 will display content names such as "HEAT", "PLANET", "BLACK", "SOUL", etc. for example in a part of the field 383 where a content name is to be displayed, and also an artist name such as "KUWAI" for example in a part of the field 383 where an artist name is to be displayed.

[0199] When having received more two pieces of CD information from the WWW server 5-1, the recording program 113 will have the display unit 20 display a dialog box as shown in FIG. 21 for selection by the user of any of the CD information pieces.

[0200] FIG. 22 shows a dialog box the recording program 113 has the display unit 20 display when the button 384 is clicked with "CDNEW JAPAN" set in the field 401 and in which a search keyword is to be set.

[0201] As shown in FIG. 22, the dialog box has disposed therein buttons 431, 432, 433 and 434. The button 431 is to be activated by clicking for searching CD information taking an album name as a search keyword. The search keyword for the album name is set in a field 441 also disposed in the dialog box.

[0202] The button 432 is to be activated by clicking for searching CD information taking an artist name as a search keyword. The search keyword for the artist name is set in a field 442 also disposed in the dialog box.

[0203] The button 433 is to be activated by clicking for searching CD information taking a content name as a search keyword. The search keyword for the content name is set in a field 443 also disposed in the dialog box.

[0204] The button 434 is to be activated by clicking for searching CD information taking a product No. as a search keyword. The search keyword for the product No. is set in a field 444 also disposed in the dialog box.

[0205] For searching CD information, at least any one of the buttons 431 to 434 is activated.

[0206] When searching CD information taking an artist name as a search keyword as shown in FIG. 23, the button 434 is activated and a string of characters indicating the artist name such as "KUWAI" is set in the field 442.

[0207] When the search button disposed in the dialog box to set a search keyword is clicked, the recording program 113 will connect to the WWW server 5-2 based on a previously stored URL or the like, request the WWW server 5-2 for CD information following a proce-

dure corresponding to "CDNEW JAPAN" set in the field 401 and based on the search keyword set in the dialog box, and receive the CD information from the WWW server 5-2.

[0208] The WWW server 5-2 sends the CD information along with data for displaying an image which prompts the user to purchase a CD related with the searched CD information to the personal computer 1 as shown in FIG. 24. The user of the personal computer 1 can purchase a predetermined CD via the network 2 based on the data for displaying the image which prompts the user to purchase the CD.

[0209] Referring now to FIG. 25, there is shown, for explanation, a window the recording program 113 has the display unit 20 display when it has received the CD information from the WWW server 5-2 after clicking the search button 384 disposed in the dialog box to set the search keyword. Based on the CD information received from the WWW server 5-2, the recording program 113 displays a CD title such as "Asynchronized" for example in the field 381, and also an artist name such as "KUWAI" for example in the field 382.

[0210] Based on the CD information received from the WWW server 5-2, the recording program 113 will display content names such as "HEAT", "PLANET", "BLACK", "SOUL", etc. for example in a part of the field 383 where a content name is to be displayed, and also an artist name such as "KUWAI" for example in a part of the field 383 where an artist name is to be displayed.

[0211] After the recording program 113 receives a predetermined CD information, it will store the CD information into the directory in the HDD 21, designated in the field 404.

[0212] When instructed to acquire CD information by the user clicking the button 384 or the like, the recording program 113 will first search the directory in the HDD 21, designed in the field 404. When the CD information is stored in the directory in the HDD 21, designated in the field 404, the recording program 113 will display a dialog box 461 shown in FIG. 26 to prompt the user to select whether the CD information stored in the directory designated in the field 404 is to be used.

[0213] When the button 386 for instructing to start recording of any one of the contents displayed in the window the recording program 113 has the display unit 20 display is clicked, the recording program 113 will read the content from a CD set in the drive 22 and supply the content read from the CD along with the CD information to the content management program 111. The compression method conversion program 134 in the content management program 111 will compress the content supplied from the recording program 113 by a predetermined compression method, and the encryption program 135 will encrypt the compressed content. The usage rule conversion program 136 generates usage rule data corresponding to the compressed and encrypted content.

[0214] The content management program 111 will thus supply the compressed and encrypted content along with the usage rule data to the content data base 114.

[0215] The content data base 114 generates the content file 161 and usage rule file 162 corresponding to a content received from the content management program 111, and stores the content into the content file 161 and the usage rule data into the usage rule file 162.

[0216] When the content and usage rule data corresponding to the content are stored in the content data base 114, the content management program 111 will supply the CD information and usage rule data received from the recording program 113 to the display/operation instruction program 112.

[0217] The display/operation instruction program 112 will generate the original package display data 201 and content display data 221 based on the usage rule data and CD information corresponding to the content stored in the content data base 114 by the recording.

[0218] As shown in FIG. 27, when the button 345 is selected, the name of the original package (CD title) corresponding to the content stored in the content data base 114 by the recording is displayed in the field 351 in the display/operation instruction window. When the package is selected, a content name corresponding to the content read from the CD is displayed in the field 352.

[0219] When the content read from the CD is recorded in the content data base 114 and the button 385 in the window the recording program 113 has the display unit 20 display is selected (activated), the display/operation instruction program 112 displays, in the display/operation instruction window, a field 481 in which the name of a content stored in a previously designated one of the portable devices 6-1 to 6-3 is to be displayed, as shown in FIG. 28.

[0220] Corresponding to each music title of the content, a symbol indicating if the content can check in to the personal computer 1-1 is displayed on the leftmost of the field 481. For example, a "o" positioned on the leftmost of the field 481 indicates that the content corresponding to the music name of the content can check in to the personal computer 1-1, that is, the content has been checked out from the personal computer 1-1. As exemplified in FIG. 29, a "x" positioned on the leftmost of the field 481 indicates that the content corresponding to the music name of the content cannot check in to the personal computer 1-1, that is, the content has not been checked out from the personal computer 1-1, but instead, e.g., the content has been checked out from the personal computer 1-2.

[0221] The display/operation instruction program 112 has the content management program 111 check out the content read from the CD and recorded in the content data base 114 to any of the portable devices 6-1 to 6-3, previously designated.

[0222] Thus, just with the button 385, in the window the recording program 113 has the display unit 20 dis-

play, being kept activated, when the content read from the CD is recorded into the content data base 114, the personal computer 1 can check out the content read from the CD to any of the portable devices 6-1 to 6-3, previously designated.

[0223] When the display/operation instruction program 112 has displayed the field 481 in the display/operation instruction window, it also displays, in the display/operation instruction window, a field 482 in which the name of a portable package to which a content stored in any of the portable devices 6-1 to 6-3, previously designated belongs (namely, a package to which a content stored in any of the portable devices 6-1 to 6-3 belongs) is displayed, a button 483 to close the field 481, and a button 484 to execute check-in or checkout.

[0224] Further, when the display/operation instruction program 112 has displayed the field 481 in the display/operation instruction window, it displays, in the display/operation instruction window, also a button 491 to set checkout of a content corresponding to content name selected in the field 352, a button 492 to set check-in of a content corresponding to a content name selected in the field 481, a button 493 to set check-in of all contents corresponding to content names displayed in the field 481, and a button 494 to cancel the setting of check-in or checkout.

[0225] Next, setting of check-in or checkout and execution of the check-in or checkout will be described below:

[0226] When the button 343 for displaying a filed in which check-in or checkout is to be set is clicked, the display/operation instruction program 112 displays, in the display/operation instruction window, the field 481 in which the name of a content stored in any of the portable devices 6-1 to 6-3, previously designated is to be displayed.

[0227] For example, when content names "MINAMI-NO-SAKABA", "KITA-NO-HAKABA" and "SHICHINA-RABE" displayed in the field 352 are selected as shown in FIG. 29 and the button 491 is clicked, the display/operation instruction program 112 sets checkout of contents corresponding to the content names "MINAMI-NO-SAKABA", "KITA-NO-HAKABA" and "SHICHINA-RABE", respectively, and displays the content names "MINAMI-NO-SAKABA", "KITA-NO-HAKABA" and "SHICHINARABE" in the field 481, as shown in FIG. 30.

[0228] Corresponding to the content name "OHSHOH", a "o" positioned on the leftmost of the field 481 indicates that the content corresponding to the content name "OHSHOH" can check in to the personal computer 1-1. That is, the content corresponding to the content name "OHSHOH" is one that has been checked out from the personal computer 1-1.

[0229] Corresponding to the content name "FU", a "x" positioned on the leftmost of the field 481 indicates that the content corresponding to the content name "FU" cannot check in to the personal computer 1-1. That is, the content corresponding to the content name "FU" is not one that has been checked out from the personal computer 1-1, but instead, e.g., one that has been checked out from the personal computer 1-2.

[0230] Corresponding to the content name "KAKU", a "x" positioned on the leftmost of the field 481 indicates that the content corresponding to the content name "KAKU" cannot check in to the personal computer 1-1. That is, the content corresponding to the content name "KAKU" is not one that has been checked out from the personal computer 1-1, but instead, e.g., one that has been checked out from the personal computer 1-2.

[0231] Corresponding to the content name "HISHA", a "o" positioned on the leftmost of the field 481 indicates that the content corresponding to the content name "HISHA" can check in to the personal computer 1-1. That is, the content corresponding to the content name "HISHA" is one that has been checked out from the personal computer 1-1.

[0232] As the content corresponding to the content name "MINAMI-NO-SAKABA", the content corresponding to the content name "KITA-NO-HAKABA" and the content corresponding to the content name"SHICHINA-RABE" are ones that have been checked out from the personal computer 1-1, a "O" is displayed on the leftmost of the field 481, corresponding to each of the content name "MINAMI-NO-SAKABA", the content name "KITA-NO-HAKABA" and the content name"SHICHINA-RABE".

[0233] At this time, the display/operation instruction program 112 changes a number of possible checkouts for the content name "MINAMI-NO-SAKABA" in the field 352 from three one-eighth notes indicating three checkouts to two one-eighth notes indicating two checkouts, a number ofpossible checkouts for the content name "KITA-NO-HAKABA" also in the field 352 from two one-eighth notes indicating two checkouts to a one-eighth note indicating one checkout, and a number of possible checkouts for the content name "SHICHINARABE" also in the field 352 from three one-eighth notes indicating three checkouts to two one-eighth notes indicating two checkouts.

[0234] For example, when in the status shown in FIG. 30, the content name "KITA-NO-HAKABA" is selected in the field 481 and the button 492 is clicked, the display/operation instruction program 112 will set check-in of the content corresponding to the content name "KITA-NO-HAKABA" and erase this content name in the field 481 as shown in FIG. 31.

[0235] At this time, the display/operation instruction program 112 will change the number of possible checkouts for the content name "KITA-NO-HAKABA" displayed in the field 352 from a one-eighth note indicating one checkout to two one-eighth notes indicating two checkouts.

[0236] Also, by dragging and dropping a package name displayed in the field 351 to the field 481, checkout of all contents belonging to a package corresponding to the dragged and dropped package name is set.

[0237] With setting of check-in or checkout only by operating the buttons 491 to 494, the personal computer 1 will not execute any check-in or checkout.

[0238] When the button 484 is clicked after check-in or checkout is set by operating the buttons 491 to 494, the display/operation instruction program will have the content management program 111 execute the check-in or checkout. That is, with the button 484 clicked, the display/operation instruction program 112 will have the content management program 111 send either a content to any of the portable batteries 6-1 to 6-3 or a predetermined command corresponding to check-in (for example, a command for erasing a predetermined content stored in any of the portable devices 6-1 to 6-3), based on the check-in or checkout setting, and erase usage rule data stored in the usage rule file 162 corresponding to the sent content or command.

[0239] When check-in or checkout is done, the display/operation instruction program 112 updates a history data stored in the history data file correspondingly to the sent content or command. The history data includes information for identification of the checked-in or checked-out content or data at which the content has been checked in or out, and the name of any of the portable devices 6-1 to 6-3 to which the content has been checked out.

[0240] Since check-in or checkout can be set in a short time, the user can quickly know the status after execution of check-in or checkout. Thus, the number of check-in's or checkouts which takes time can be reduced to shorten the entire time necessary for check-in or checkout (including the time for setting and execution of check-in or checkout).

[0241] Next, edition of My Select package such as addition of a desired content o a predetermined My Select package will be described.

[0242] As shown in FIG. 32, when the button 344 for displaying a field in which a My Select package is edited is clicked, the display/operation instruction program 112 displays, in the display/operation instruction window, a field 501 in which a content name corresponding to a content belonging to a predetermined My Select package is to be indicated.

[0243] At this time, the display/operation instruction program 112 displays, in the display/operation instruction window, a field 502 in which the name of a selected My Select package (stored in any of the package display data 251-1 to 251-S) is to be displayed. When the name of a My Select Package to be edited is set in the field 502, the display/operation instruction program 112 displays, in the field 501, a content name corresponding to the My Select package having the package name (stored in a content display data 221 related with any of the package display data 252-1 to 252-S).

[0244] Further, when the display/operation instruction program 112 displays the field 501 in the display/operation instruction window, it will display, in the display/operation instruction window, a button 521 for an operation to have a content corresponding to a content name selected in the field 352 also belong to a My Select package whose name is displayed in the field 502 (to store a content ID of the selected content display data 221 into any of the package display data 251-1 to 251-S), a button 522 for an operation to erase the content corresponding to the content name selected in the field 501 from the My Select package whose name is displayed in the field 502 (to erase the content ID of the selected content display data 221 from any of the package display data 251-1 to 251-S), and a button 523 for an operation to cancel an preceding operation (to have the content also belong to the My Select Package or erase the content from the My Select package).

[0245] For example, by displaying the field 501 in the display/operation instruction window, the user can have, belong to the My Select package whose package name "My Best 1" is displayed in the field 502, a content named "North Star", content named "Shooting Star", content named "South-Alps", content named "Multimillionaire" and a content named " Slot 1".

[0246] That is to say, In response to a predetermined operation, the display/operation instruction program 112 stores into the package display data 251 in which the package name "My Best 1" is stored the IDs for the content named "North Star", content named "Shooting Star", content named "South-Alps", content "Multimillionaire", and the content named "Slot 1", respectively.

[0247] Also, when the package name displayed in the field 351 is dragged and dropped to the field 501, all contents belonging to a package corresponding to the dragged and dropped package can be made to belong to the My Select package whose name is displayed in the field 502.

[0248] When the button 346 disposed in the display/operation instruction window to display, in the field 351, data corresponding to a My Select package is activated, the display/operation instruction program 112 will display, in the field 351, package names corresponding to the My Select package (e.g., "My Best 1", "My Best 2", "Snow Drive", "MINAMI-NO-SHIMA-Select", "Traveling Abroad", etc.), and in the field 352 names of contents belonging to a My Select package corresponding to a selected package name, as shown in FIG. 33.

[0249] When the name of a predetermined content displayed in the field 352 is selected and the erasing operation is made while data corresponding to a My Select package has been displayed in the field 351 with the button 346 activated, the display/operation instruction program 112 will erase only data of a content ID corresponding to a content belonging to the package included in the package display data 251 but not any predetermined content stored in the contend data base 114.

[0250] Next, display corresponding to a filtering package, and relating the filtering package with a desired content will be described:

[0251] When the button 347 disposed in the display/operation instruction window to display, in the field 351,

data corresponding to a filtering package is activated, the display/operation instruction program 112 displays, in the field 351, package names corresponding to the filtering package (e.g., "Ten best pops", "Ten Best rock 'n' roll's", "Ten best ENKA's", "Standard love songs", "Recommendable '80 pops", etc.), and, in the field 352, names of contents belonging to the filtering package corresponding to the selected package name, as shown in FIG. 34.

[0252] Referring now to FIG. 35, there is explained the generation of a filtering package. The display/operation instruction program 112 generates package display data 291-1 based on the content display data 221-1-1 to 221-M-p stored in the display data file 182 and history data stored in the history data file 184 or any of them and filtering data 551-1 stored in the filtering data filter 181.

[0253] The package display data 291-1 has stored therein ID for a content belonging to a filtering package corresponding to thereto.

[0254] For example, the package display data 291-1 stores IDs for predetermined 10 contents (e.g., ones corresponding to ten best pops) designated with the filtering data 551-1.

[0255] The display/operation instruction program 112 generates package display data 291-2 based on the content display data 221-1-1 to 221-M-p stored in the display data file 182 and history data stored in the history data file 184 or any of them and filtering data 551-1-2 stored in the filtering data filter 181.

[0256] The package display data 291-2 has stored therein ID for a content belonging to a filtering package corresponding to thereto.

[0257] For example, the package display data 291-2 stores IDs for contents whose names contain a predetermined string of characters (e.g., names of contents including characters "love") designated with the filtering data 551-2.

[0258] Similarly, the display/operation instruction program 112 generates package display data 291-3 to 291-A. Each of the package display data 291-3 to 291-A has stored therein ID for a content belonging to a filtering package corresponding thereto.

[0259] For example, the package display data 291-3 stores IDs for 10 contents selected based on the history data stored in the history data file 184 and which have been checked out most frequency for the last week.

[0260] Also the package display data 291-4, for example, stores IDs for 10 contents selected at random and whose total of play times counts 60 minutes.

[0261] In this way, the display/operation instruction program 112 generates package display data 291-2 based on the content display data 221-1-1 to 221-M-p stored in the display data file 182 and history data stored in the history data file 184 or any of them and filtering data 551-1-1 to 551-1-A stored in the filter data file 181.

[0262] The filtering data 551-1 to 551-A are downloaded from a predetermine server via the network 2, or supplied as recorded in a predetermined CD from the drive 22. Also, the user himself can generate the filtering data 551-1 to 551-A.

[0263] For example, operating the personal computer 1 to generate a new filtering package by down-loading and updating the filtering data 551-1 to 551-A from more than one server via the network 2 at a predetermined time every day without modification of contents recorded in the content data base 114, the user can use the new generated filtering package for enjoying different combinations of contents.

[0264] Next, an image displayed in the field 348 will be described below. As shown in FIG. 36, when a package name displayed in the field 351 is selected while a content name displayed in the field 352 has not been selected (therefore, no content has not been played back), the display/operation instruction program 112 displays, in the field 348, an image related with a package corresponding to the selected package name.

[0265] That is, referring to data indicating the image file name stored in the package display data 211, 251 or 291, the display/operation instruction program 112 selects any one of the image files 183-1 to 183-K, reads image data stored in the selected one of the image files 183-1 to 183-K, and displays, in the field 348, an image corresponding to the image data.

[0266] For example, when the package name "Second" of the original package is selected while the content name displayed in the field 352 is not selected, he display/operation instruction program 112 refers to data indicating an image file name stored in the package display data 211, reads image data stored in a predetermined one of the image files 183-1 to 183-K, and displays, in the field 348, an image corresponding to the image data.

[0267] Also, when a predetermined image is dragged and dropped to the field 348 with the package name displayed in the field 351 being selected and the content name displayed in the field 352 being not selected, the display/operation instruction program 112 makes the dragged and dropped image correspond to a package corresponding to the selected package name.

[0268] That is, the display/operation instruction program 112 converts the coding method by which the dragged and dropped image has been coded to a predetermined method (e.g., JPEG (Joint Photographic Experts Group) or the like), adjusts the size of the image (e.g., to 30 pixels by 30 pixels or the like), subtracts the colors (e.g., 256 colors or the like), records the image into the image file 183, and records the name of the image file 183 in which the image has been recorded as data indicating any image file name in the package display data 211, 251 or 291 corresponding to the package name.

[0269] As shown in FIG. 37, when the content name displayed in the field 352 is selected while no content has been played back, the display/operation instruction program 112 displays, in the field 348, an image related

with a content corresponding to the selected content name. That is to say, the display/operation instruction program 112 refers to data indicating an image file name stored in the content display data 221 corresponding to the content corresponding to the selected content name, reads image data stored in a predetermined one of the image files 183-1 to 183-K, and displays, in the filed 348, an image corresponding to the image data.

[0270] For example, when the package name "Second" of the original package is selected and the content name "South-Alps" displayed in the field 352 is selected while the content "South-Alps" has not been played back, the display/operation instruction program 112 refers to a corresponding image file stored in the content display data 221 corresponding to a content corresponding to the content name "South-Alps", reads image data stored in a predetermine one of the image files 183-1 to 183-K, and displays, in the field 348, an image corresponding to the image data.

[0271] At this time, when the button 345 is activated while data indicating an image file name is not set in the content display data 221 corresponding to a content corresponding to a selected content name, the display/operation instruction program 112 refers to data indicating an image file name stored in the content display data 221 to which the content belongs, reads image data stored in a predetermine one of the image files 183-1 to 183-K, and displays, in the field 348, an image corresponding to the image data.

[0272] Similarly, when the button 346 is activated while no corresponding image file is set in the content display image .221 corresponding to a content corresponding to a selected content name, the display/operation Instruction program 112 refers to data indicating an image file name stored in the package display data 251 to which the content belongs, reads image data stored in a predetermine one of the image files 183-1 to 183-K, and displays, in the field 348, an image corresponding to the image data.

[0273] Similarly, when the button 347 is activated while no corresponding image file is set in the content display data 221 corresponding to a content corresponding to a selected content name, the display/operation Instruction program 112 refers to data indicating an image file name stored in the package display data 291 to which the content belongs, reads image data stored in a predetermine one of the image files 183-1 to 183-K, and displays, in the field 348, an image corresponding to the image data.

[0274] Also, when a predetermined image is dragged and dropped to the field 348 while the content name displayed in the field 352 is selected, the display/operation Instruction. program 112 relates the dragged and dropped image with a content corresponding to the selected content name. Namely, the display/operation instruction program 112 converts the coding method by which the dragged and dropped image has been coded to a predetermined one; adjusts the size of the image, subtracts the colors, records the image into the image file 183, and records the d name of the recorded image file 183 In which the image has been stored as data indicating any image file name in the package display data 221corresponding to the content name.

[0275] As shown in FIG. 38, when a content corresponding to a content name displayed in the field 352 has been played back (when a sound has been outputted from the speaker 24), the display/operation Instruction program 112 displays, in the field 348, an image indicating a signal level in each frequency band (e.g., in each octave) of the output sound (that is a so-called image on a spectrum analyzer).

[0276] Also as shown in FIG. 39, when a content corresponding to a content name displayed in the field 352 has been played back according to a user's setting, the display/operation instruction program 112 displays, in the field 348, an image indicating a signal level corresponding to the time lapse of the output sound during a predetermined period.

[0277] Also, when the display/operation instruction program 112 does not display the fields 351 and 352 according to a user's setting, the display/operation instruction program 112 will display, in the field 348, an image indicating a signal level in each frequency band of the output sound when a content has been played back, and an image corresponding to a selected package or content when no content has been played back, as shown in FIGS. 40 and 41.

[0278] Next, how contents are combined will be described. The content management program 111 combines contents when the contents belong to the same original package, the number of possible checkouts for them is equal to the maximum number of possible checkouts, that is, the maximum number of possible checkouts for one of the contents is equal to that for the other and no playback time limit is set for them.

[0279] As shown in FIG. 42, in case the display of the original package has been selected, if names corresponding to two or more content names displayed in the field 352, such as "Heat" and "Sonic, are selected, namely, if contents belonging to the samé original package are selected, and the combine command is selected from the edit menu, the content management program 111 combines the contents corresponding to "Heat" and "Sonic", respectively, together to generate a new content, stores it into a new content file 161, and records the content file 161 into the content data base 114.

[0280] The content management program 111 generates a usage rule file 162 for the content generated by the above content combination and stored In the new content file 161, and records the usage rule file 162 into the content data base 114.

[0281] A name for the content generated by the above content combination is generated from the names of the contents having been combined as in the above. For example, the display/operation instruction program 112 will give a name "Heat + Sonic" to the content generated

by combining the contents corresponding to the names "Heat" and "Sonic", respectively, as shown in FIG. 43.

[0282] Note that the content management program 111 will not combine any contents which are selected from the My Select package or filtering package. That is, the combine command cannot be selected from the menu in the window displayed by the display/operation instruction program 112.

[0283] Next, how a content is divided will be described. The content management program 111 divides a content whose number of possible checkouts is equal to a maximum number of possible checkouts, that is, which has not yet been checked out and for which no playback time limit has been set.

[0284] As shown in FIG. 44, in case the display of the original package has been selected, if the combine command is selected from the edit menu while a predetermined content, such as a content having a name "Butterfly" is being played back, the content management program 111 divides a content corresponding to "Butterfly" at a position thereof being played back to generate two contents, stores them into a new content file 161, and records the content file 161 into the content data base 114.

[0285] The content management program 111 generates a usage rule file 162 for the contents generated by the above content division and stored in the new content file 161, and records the usage rule file 162 into the content data base 114.

[0286] Names for the contents generated by the above content division are generated from the name of the content having been divided as in the above. For example, the display/operation instruction program 112 gives names "Butterfly (1)" and "Butterfly (2)" to the contents, respectively, generated by dividing the content corresponding to the name "Butterfly" as shown in FIG. 45.

[0287] Note that the content management program 111 will not divide any content which is selected from the My Select package or filtering package. That is, the combine command cannot be selected from the menu in the window displayed by the display/operation instruction program 112.

[0288] Next, operations for a registration, effected when the display/operation instruction program 112 is initially started with the content management program 111 and display/operation instruction program 112 installed in the personal computer 1, will be described with reference to the flow chart shown in FIG. 46:

[0289] At step S11, the display/operation instruction program 112 installed in the personal computer 1 refers to predetermined URL and the like network 2 and connects to the EMD registration server 3.

[0290] At step S12, the display/operation instruction program 112 sends, to the EMD registration server 3, the ID of the content management program 111, previously stored in the content management program 111, along with necessary data for the registration (such as the name of a user of the personal computer 1 and credit No.). Note that at step S12, the display/operation instruction program 112 may send, to the EMD registration server 3, the ID of the display/operation instruction program 112, previously stored in the display/operation instruction program 112, along with the necessary data for the registration.

[0291] At step S13, the EMD registration server 3 receives the content management program 111. At step S14, the EMD registration server 3 judges whether the ID of the content management program 111 is valid. When the ID of the content management program 111 is determined to be valid, the operation goes to step S15 where the EMD registration server 3 will register the user of the personal computer 1 based on the name of the user and credit No., and sends a predetermined number of authenticate keys (for use for mutual authentication with the EMD servers 4-1 to 4-3, for example) to the personal computer 1.

[0292] At step S16, the display/operation instruction program 112 receives the predetermined number of authenticate keys sent from the EMD registration server 3. At step S17, the EMD registration server 3 sends the EMD selection program 131 to the personal computer 1. At step S18, the display/operation instruction program 112 receives the EMD selection program 131 sent from the EMD registration server 3.

[0293] At step S19, the display/operation instruction program 112 supplies the received EMD selection program 131 to the content management program 111. At step S20, the content management program 111 starts the EMD selection program 131. Thus, the procedure for the registration is complete.

[0294] If at step S14, the ID of the content management program 111 is determined to be invalid, the operation goes to step S21 where the EMD registration server 3 will send a predetermined error message to the personal computer 1 without effecting any registration. At step S22, the display/operation instruction program 112 receives the error message sent from the EMD registration server 3.

[0295] At step S23, the display/operation instruction program 112 displays the received error message. Thus, the procedure for the registration is complete.

[0296] When the display/operation instruction program 112 is started, the personal computer 1 acquires the authenticate keys used for the mutual authentication with the EMD servers 4-1 to 4-3 and the EMD selection program 131, for example.

[0297] Next, recording from a CD according to the recording program 113 will be described with reference to the flow chart in FIG. 47. At step S41, the recording program 113 puts the drive 22 into action, reads data corresponding to a content recorded in the CD set in the drive 22 (number of contents or play time), and displays a contents list recorded in the CD in a predetermined window.

[0298] At step S42, the recording program 113 judges

whether the button 348 for acquisition of information corresponding to the CD has been clicked. When it is determined that the button 384 has been clicked, the operation goes to step S43 where the recording program 113 will acquire the information corresponding to the CD. The acquisition of the information corresponding to the CD will further be described later with reference to the flow chart in FIG. 48.

[0299] At step S44, the recording program 113 displays, in a predetermined window, the information corresponding to the CD, having been acquired by the operation at step S43.

[0300] If at step S42, it is determined that the button 384 for acquisition of information corresponding to a CD has been clicked, it is not necessary to acquire the information corresponding to the CD, so the operation slips over steps S43 and S44 and goes to step S45.

[0301] At step S45, the recording program 113 judges whether the button 386 for instruction to start recording of a content recorded in the CD has been clicked. If it is determined that the button 386 has not been clicked, the operation goes back to step S45 where it will be repeatedly judged whether the button 386 has been clicked, until it is determined that the button 386 has been clicked.

[0302] When it is determined, at step S45, that the button 386 has been clicked, the operation goes to step S46 where the recording program 113 will acquire, based on a check set correspondingly to a content name in the field 383, content selection information indicating which of contents recorded in the CD is to be recorded. At step S47, the recording program 113 reads a selected content from the CD based on the content selection information.

[0303] At step S48, the recording program 113 has the compression method conversion program 134 in the content management program 111 compress the content read from the CD by a predetermined conversion method such as ATRAC3, for example. At step S49, the recording program 113 has the encryption method conversion program 135 in the content management program 111 encrypt the compressed content by a predetermined encryption method such as DES, for example.

[0304] At step S50, the recording program 113 has the content data base 114 store the compressed and encrypted content. At step S51, the recording program 113 generates usage rule data corresponding to the content stored in the content data base 114, and has the content data base 114 store the generated usage rule data into the usage rule file 162 (related with the content stored in the content data base 114). At step S52, the recording program 113 updates the display data file 182 based on the generated usage rule data or information corresponding to the CD.

[0305] At step S53, the recording program 113 judges whether the button 385 for setting checkout, or no checkout, of the content read from the CD to any of the portable devices 6-1 to 6-3 (automatic checkout) is activated. When it is determined that the button 385 is active, the operation goes to step S54 where the display/operation instruction program 112 is started.

[0306] At step S55, the recording program 113 has the display/operation instruction program 112 check out the content stored in the content data base 114 to any of the portable devices 6-1 to 6-3. Thus, the procedure is complete.

[0307] If it is determined, at step S53, that the button 385 is not active, it is not necessary to check out the content, the operation is complete with a skip over steps S54 and S55.

[0308] When the recording from the CD is effected with the button 385 being active, the personal computer 1 will store the content read from the CD into the content data base 114 and automatically check it out to any of the portable devices 6-1 to 6-3.

[0309] Similarly, when the display/operation instruction program 112 receives a content from any of the EMD servers 4-1 to 4-3 while check is made with the check button 334, it will store the received content into the content data base 114 and have the content management program 111 check out the content to any of the portable devices 6-1 to 6-3.

[0310] Next, acquisition of information corresponding to a CD, effected under the recording program 113 and at step S43 in FIG. 47, will be described with reference to the flow chart in FIG. 48:

[0311] At step S71, the recording program 113 searches information recorded in a predetermined directory (e.g., directory in the HDD 21, designated in the field 404 in the dialog box 461).

[0312] At step S72, the recording program 113 judges, based on data corresponding to a content recorded in a CD set in the drive 22 (e.g., number of contents or play time), whether information corresponding to the CD is recorded in the predetermined directory. If it is determined that the information corresponding to the CD is not recorded in the predetermined directory, the operation goes to step S73 where it is judged, based on a character string set in the field 401, whether CDNEW has been selected.

[0313] When it is determined, at step S73, that CDNEW has been selected, the operation goes to step S74 where the recording program 113 will connect to a server corresponding to CDNEW (e.g., WWW server 5-2) via the network 2. At step S75, the recording program 113 has the display unit 20 display a screen for input of a search keyword (e.g., dialog box shown in FIG. 22). At step S76, the recording program 113 sends, to a server corresponding to CDNEW, a search keyword inputted based on the screen such as album name, artist name, content name, product No. or the like.

[0314] At step S77, the recording program 113 receives information corresponding to the CD from a server corresponding to CDNEW.

[0315] At step S78, the recording program 113 relates the information corresponding to the CD with the con-

tent, and terminates the procedure.

[0316] If it is determined, at step S73, that CDNEW has not been selected, the operation goes to step S79 since CDDB has been selected. At step S79, the recording program 113 will connect to a server corresponding to CDDB (e.g., WWW server 5-1) via the network 2 based on URL of the first site of CDDB set in the field 402 and URL of the second site of CDDB set in the field 403. At step S80, the recording program 113 sends, to a server corresponding to CDDB, data corresponding to a play time of a content recorded in the CD.

[0317] At step S81, the recording program 113 receives information corresponding to the CD from the server corresponding to CDDB.

[0318] At step S82, the recording program 113 judges whether data corresponding to the CD, received from the server corresponding to CDDB, include more than two candidates. When it is determined that there are available more than two candidates, the operation goes to step S83 where a dialog box will be displayed for allowing the user to select use or no use of information corresponding to any CD.

[0319] At step S84, the recording program 113 selects any one of the candidates based on an input to the dialog box, and the operation goes to step S78 where the recording program 113 will relate information corresponding to the CD with the content. Thus the procedure is complete.

[0320] If it is determined, at step S82, that there are not available more than two candidates, the operation goes to step S78 where the recording program 113 will relate the information corresponding to the CD, having been received from the server corresponding to CDDB, and thus the procedure is complete.

[0321] When it is determined, at step S72, that the information corresponding to the CD is recorded in the predetermined directory, the operation goes to step S85 where the recording program 113 will read the recorded information corresponding to the CD, and goes to step S78 where it will relate the read information corresponding to the CD with the content, and thus the procedure is complete.

[0322] As in the above, the recording program 113 acquires information corresponding to the CD from any of two or ore servers different in searching procedure from each other. Also, when information corresponding to the CD has been acquired and recorded, the recording program 113 will use the recorded information.

[0323] Next, how to record data to the display data file 182 under the display/operation instruction program 112 will be described with reference to the flow chart shown in FIG. 49. As shown, at step S91, the display/operation instruction display program 112 generates a record in the main table in the display data file 182.

[0324] At step S92, the display/operation instruction program 112 reads the type of data to be recorded into the display data file 182. At step S93, the display/operation instruction program 112 judges whether or not the type of the data read at step S92 is that of data to be recorded to the main table in the display data file 182. If the display/operation instruction program 112 determines that the type of the read data is the type of the data to be recorded to the main table, it goes to step S94 where it will record the data to an item corresponding to the type of the data recorded in the main table generated at step S91. Then the display/operation instruction program 112 will go to step S95.

[0325] At step S95, the display/operation instruction program 112 judges whether all data have been recorded. If the display/operation instruction program 112 determines that all the data have not yet been recorded, it returns to step S91 and repeats the data recording.

[0326] If the display/operation instruction program 112 determines at step S95 that all the data have been recorded, it ends the operation.

[0327] If the display/operation instruction program 112 determines at step S93 that the type of the read data is not the type of the data to be recorded to the main table, it goes to step S96 where it will generate a record in a sub table in the display data file 182. At step S97, the display/operation instruction program 112 records the type of data to an item of the record generated in the sub table at step S96. At step S98, the display/operation instruction program 112 records the data to the item of the record generated in the sub table at step S96, and goes to step S95 where it will judge whether all data have been recorded.

[0328] As in the above, the display/operation instruction program 112 can record data of a predetermined type in the main table in the display data file 182, and record, in the display data file 182, the type of data and data of other type than that of data recorded in the main table.

[0329] Next, data read from the display data file 182 by the display/operation instruction program 112 will be described with reference to the flow chart shown in FIG. 50. At step S101, the display/operation instruction program 112 acquires a content ID or package ID corresponding to a content to be read. At step S102, the display/operation instruction program 112 acquires the type of the data to be read.

[0330] At step S103, the display/operation instruction program 112 judges whether the type of the data acquired at step S102 and which is to be read is that of the data to be recorded to the main table in the display data file 182. If the display/operation instruction program 112 determines that the type of the data to be read is that of the data to be recorded to the main table, it goes to step S104 where it will read a record corresponding to a content ID or package ID from the main table in the display data file 182. At step S105, the display/operation instruction program 112 reads, from the record read at step S104, data corresponding to the type of data recorded as a predetermined item and which is to be read, and ends the operation.

[0331] If it is determined, at step S103, that the type

of the data to be read is not that. of the data to be recorded to the main table, the data to be read is recorded in the sub table and so the display/operation instruction program 112 goes to step S106 where it will read a record corresponding to a content ID or package ID from the sub table in the display data file 182. At step S107, the display/operation instruction program 112 judges whether the type of the data stored in an item of the record read at step S106 is that of the data to be read. If it is determined that the type of the data stored in the item of the read record is not that of the data to be read, the display/operation instruction program 112 returns to step S106 and repeats the read of a record from the sub table.

[0332] If it is determined, at step S107, that the type of the data stored in the item of the read record is that of the data to be read, the display/operation instruction program 112 goes to step S108 where it will read the data from the record and ends the operation.

[0333] As in the above, the display/operation instruction program 112 can read a predetermined type of data from the display data file 182.

[0334] Next, generation of a filter package, performed by the display/operation instruction program 112 when the button 437 is clicked, will be described with reference to the flow chart in FIG. 51. At step S111, the display/operation instruction program 112 selects a first filtering data 551, for example, the filtering data 551-1, stored in the filtering data file 181.

[0335] At step S112, the display/operation instruction program 112 computes a weight for the content based on data stored in the display data file 182 and history data stored in the history data file 184 or any of them and the selected filtering data 551.

[0336] At step S113, the display/operation instruction program 112 selects a content belonging to a filtering package corresponding to the selected filtering data 551 based on the weight for the content, computed at step S112.

[0337] At step S114, the display/operation instruction program 112 registers the content having been selected at step S113 into a filtering package corresponding to the selected filtering data 551. That is to say, the display/operation instruction program 112 stores an ID for the selected content into the package display data 291 corresponding to the filtering package corresponding to the selected filtering data 551.

[0338] At step S115, the display/operation instruction program 112 judges whether the content has been registered in the filtering package corresponding to all the filter data 551 stored in the filtering data file 181. if it is determined that the content has not been registered in the filtering package corresponding to all the filtering data 551, the operation goes to step S116 where a next filtering data 551 stored in the filtering data file 181 is selected, and then goes back to step S112 where the content registration will be repeated.

[0339] If at step S115 it is determined that the content has been registered in the filtering package corresponding to all the filtering data 551, the procedure is complete.

[0340] As in the above, the display/operation instruction program 112 will select a content based on data stored in the display data file 182 and history data stored in the history data file 184 or any of them and the selected filtering data 551, and register the selected content into the filtering package.

[0341] Next, content checkout or check-in effected by the display/operation instruction program 112 and content management program 111 when the field 481 is displayed in the display/operation instruction window, for example, will be described with reference to the flow chart in FIG. 52:

[0342] At step S121, the display/operation instruction program 112 reads a number of possible checkouts corresponding to the content from the display data file 182. At step S122, the display/operation instruction program 112 displays the number of possible checkouts having been read at step S121.

[0343] At step S123, the display/operation instruction program 112 judges whether the checkout setting button 491 or check-in setting button 492 has been clicked. When it is determined that the button 491 or 492 has been clicked, the operation goes to step S124 where checkout of a content corresponding to a content name selected in the field 352 or check-in of a content corresponding to a content name selected in the field 481 will be set.

[0344] At step S125, the display/operation instruction program 112 updates the number of possible checkouts in the content display data 221 in the display data file 182 correspondingly to the setting of checkout of the content corresponding to the content name selected in the field 352 or to the setting of check-in of the content corresponding to the content name selected in the field 481, having been effected at step S124, and returns to step S121 where the same procedure will be repeated.

[0345] If it is determined, at step S123, that neither the checkout setting button 491 nor check-in setting button 492 has bee clicked, the operation goes to step S126 where the display/operation instruction program 112 will judge whether the button 484 for effecting the check-in or checkout has been clicked.

[0346] When it is determined at step S126 that the button 484 has been clicked, the operation goes to step S127 where the display/operation instruction program 112 will have the check-in/checkout management program 132 in the content management program 111 effect the checkout or check-in correspondingly to the setting of content checkout or check-in. The check-in/checkout management program 132 judges, based on the usage rule data stored in the usage rule file 182, whether each content can be checked out or in. When the program 132 determines that such a content checkout or check-in is possible, it will effect it.

[0347] When it is determined that the checkout or

check-in is not possible, the check-in/checkout management program 132 will not effect it.

[0348] At step S128, the display/operation instruction program 112 has the check-in/checkout management program 132 in the content management program 111 update the number of possible checkouts for the usage rule data stored in the usage rule file 162 in the content data base 114 (corresponding to a checked-out or checked-in content) correspondingly to the execution of the content checkout or check-in.

[0349] At step S129, the display/operation instruction program 112 has the check-in/checkout management program 132 reads the number of possible checkouts from the usage rule data stored in the usage rule file 162, corresponding to the checked-out or checked-in content.

[0350] At step S130, the display/operation instruction program 112 updates the number of possible checkouts stored in the history data file 184, and updates the content display data 221 in the display data file 182 based on the number of possible checkouts having been read at step S129. Then it goes back to step S121 where the same procedure will be repeated.

[0351] When it is determined, at step S126, that the button 484 has not been clicked, no checkout or check-in will be done. So the operation goes back to step S121 where the same procedure will be repeated.

[0352] As in the above, the display/operation instruction program 112 will change the display correspondingly to the setting of checkout or check-in, and have the content management program 111 execute checkout or check-in based on the setting of checkout or check-in.

[0353] Next, image paste, effected by the display/operation instruction program 112 when a predetermined image has been dragged and dropped to the field 348, will be described with reference to the flow chart in FIG. 53. At step S151, the display/operation instruction program 112 judges whether a package has been selected. When it is determined that a package has been selected, the operation goes to step S152 where the dragged and dropped image will be changed to a predetermined size, and subjected to a coding method conversion and color subtraction.

[0354] At step S153, the display/operation instruction program 112 stores the image subject to the coding method conversion and color subtraction at step S152 into the image file 183.

[0355] At step S154, the display/operation instruction program 112 judges whether a content has been selected. When it is determined that no content has been selected, the operation goes to step S155 where the image file 183 and selected package will be related with each other (that is, the name of the image file 183 in which the content is recorded is recorded as data indicating an image file name in any of the package display data 211, 251 or 291 corresponding to the selected package), and thus the procedure is complete.

[0356] If it is determined, at step S154, that a content has been selected, the operation goes to step S156 where the display/operation instruction program 112 will relate the image file 183 with the selected content (that is, the name of the image file 183 in which the content is recorded is recorded as data indicating an image file name in the content display data 221 corresponding to the selected content), and thus the procedure is complete.

[0357] If it is determined, at step S151, that no package has been selected, there is no object with which the image is related, so the operation goes to step S157 where the display/operation instruction program 112 will display a predetermined error message and thus the procedure be complete.

[0358] As in the above, the display/operation instruction program 112 can paste the dragged and dropped image on a package or content (image and package or content are related with each other).

[0359] Next, image display effected by the display/operation instruction program 112 will be described with reference to the flow chart in FIG. 54. At step S181, the display/operation instruction program 112 judges whether a content has been played back. If it is determined that no content has been played back, the operation goes to step S182 where it will be judged whether a package has been selected.

[0360] If it is determined, at step S182, that no package has been selected, the operation goes to step S183 where the display/operation instruction program 112 will display, in the field 348, a predetermined image (e.g., an image showing the supplier of the display/operation instruction program 112) and the operation will go back to step S181 where the same procedure will be repeated.

[0361] When it is determined, at step S182, that a package has been selected, the operation goes to step S184 where the display/operation instruction program 112 will judge whether a content has been selected.

[0362] If it is determined, at step S184, that no content has been selected, the operation goes to step S185 where the display/operation instruction program 112 will display, in the field 348, an image related with the selected package (the display/operation instruction program 112 refers to data indicating an image file name stored in the package display data 211, reads image data stored in a predetermined one of the image files 183-1 to 183-K, and displays, in the field 348, an image corresponding to the image data), and go back to step S181 where it will repeat the same procedure.

[0363] If it is determined, at step S184, that a content has been selected, the operation goes to step S186 where the display/operation instruction program 112 will judge whether there is available an image related with the selected content.

[0364] If it is determined, at step S186, that there is an image related with the selected content, the operation goes to step S187 where the display/operation instruction program 112 will display, in the field 348, the

image related with the selected content (the display/operation instruction program 112 refers to data indicating an image file name stored in the content display data 221 corresponding to the selected content, reads image data stored in a predetermined one of the image files 183-1 to 183-K, and displays, in the field 348, an image corresponding to the image data), and go back to step S181 where it will repeat the same procedure.

[0365] If it is determined , at step S186, that there is no image related with the selected content, the operation goes to step S188 where the display/operation instruction program 112 will display, in the field 348, an image related with the selected content. Then the operation goes back to step S181 where the same procedure will be repeated.

[0366] If it is determined, at step S181, that a content has been played back, the operation goes to step S189 where the display/operation instruction program 112 will judge whether display of a signal level of a sound corresponding to each frequency band has been set. If it is determined that the display has been set, the operation goes to step S190 where the signal level of a sound corresponding to each frequency band will be displayed in the field 348. The operation goes back to step S181 where the same procedure will be repeated.

[0367] If it is determined, at step S189, that display of a signal level of a sound corresponding to each frequency band has not been set, the operation goes to step S191 where the display/operation instruction program 112 will display, in the field 348, a waveform of an output sound (signal level corresponding to a time lapse of the output sound), and go back to step S181 where it will repeat the same procedure.

[0368] As in the above, correspondingly to the selection of a package or content or the playback of a content, the display/operation instruction program 112 will display, in the field 348, any of an image related with the package, image related with the content, signal level of a sound corresponding to each frequency band and a waveform of the output sound.

[0369] Next, how to combine contents belonging to the same original package by the content management program 111 will be described with reference to the flow chart shown in FIG. 55. At step S221, the content management program 111 reads a usage rule file 162 corresponding to a first one of contents to be combined from the content data base 114. At step S222, the content management program 111 judges whether the number of possible checkouts for the first content is equal to the maximum number of possible checkouts for the first content. If the number of possible checkouts is judge to be equal to the maximum number of possible checkouts, the content management program 111 goes to step S223 where it will judge whether a playback time limit or number of times of playback is set for the first content.

[0370] If it is determined, at step S223, that no playback time limit or number of times of playback is set for the first content, the content management program 111 goes to step S224 where it will read a usage rule file 162 for the second one of the contents to be combined from the content data base 114. At step S225, the content management program 111 judges whether the number of possible checkouts for the second content is equal to the maximum number of possible checkouts for the second content. If it is determined that the number of possible checkouts is equal to the maximum number of possible checkouts, the content management program 111 goes to step S226 where it will judge whether a playback time limit or number of times of playback is set for the second content.

[0371] If it is determined, at step S226, that no playback time limit or number of times of playback is set for the second content, the content management program 111 goes to step S227 where it will judge whether the maximum number of possible checkouts for the first content is equal to that for the second content. If it is determined that the maximum number of possible checkouts for the first content is equal to that for the second content, the content management program 111 goes to step S228.

[0372] At step S228, the content management program 111 reads the first and second contents from content files 161 of the content data base 114, corresponding to the first and second contents, respectively, combines the contents together, and record the combination of the contents. That is, the content management program 111 generates a new content file 161 in the content data base 114, and stores the content combination into the content file 161.

[0373] At step S229, the display/operation instruction program 112 generates a name for the content combination, and stores the content name generated in the content data base 114 into the display data file 182. At step S230, the content management program 111 allows the content data base 114 to update the usage rule file 162 so that the maximum number of possible checkouts and number of possible checkouts for the combined contents is equal to those for the first content, and ends the operation.

[0374] If it is determined, at step S222, that the number of possible checkouts for the first content is not equal to the maximum number of possible checkouts for the first content, the operation is ended since the first content cannot be combined. If it is determined, at step S223, that a playback time limit or number of times of playback is set for the first content, the operation is ended since the first content cannot be combined.

[0375] If it is determined, at step S225, that the number of possible checkouts for the second content is not equal to the maximum number of checkouts for the second content, the operation is ended since the second content cannot be combined. If it is determined, at step S226, that a playback time limit or number of times of playback is set, the operation is ended since the second content cannot be combined.

[0376] If it is determined at step S227 that the maximum number of possible checkouts for the first content is not equal to that for the second content, the operation is ended since the first and second contents cannot be combined.

[0377] As in the above, the personal computer 1 can combine contents which belong to the same original package, which are equal in maximum number of possible checkouts to each other, which have not been checked out, for which no playback time limit or number of times of playback are set, and which are recorded in the content data base 114. Since contents having not been checked out and for which no playback time limit or number of times of playback are set are combined together, a number of possible checkouts and playback time limit or number of times of playback for the contents will not be changed. Therefore, it is possible to prevent illegal increase of a number of possible checkouts or illegal change of a playback time limit or number of times of playback without any loss of the user's profit.

[0378] Note that it also suffices to judge whether a package to which a package to which contents belong is from a CD, not to judge whether the maximum number of possible checkouts for one of the contents is equal to that for the other content and whether a playback time limit or number of times of playback is set for each of the contents. If it is determined that the package to which the contents belong is from a CD, the contents may be combined together. Also note that for a content recorded from a CD, the maximum number of possible checkouts is constant, three for example and no playback time limit or number of times of playback is set.

[0379] Next, how to divide a content by the content management program 111 will be described with reference to the flow chart shown in FIG. 56. At step S241, the content management program 111 gets a position at which a content is to be divided, for example, a position of a played data in the content at a time elapse from start of a play or at the current time. At step S242, the content management program 111 reads a usage rule file 162 for a content to be divided from the content data base 114.

[0380] At step S243, the content management program 111 judges whether the number of possible checkouts for the content is equal to the maximum number of possible checkouts fro the content. If it is determined that the number of possible times is equal to the maximum number of possible checkouts, the content management program 111 goes to step S244 where it will judge whether a playback time limit or number of times of playback is set for the content.

[0381] If it is determined, at step S244, that no playback time limit or number of times of playback is set for the content, the content management program 111 goes to step S245 where it will read the content from a corresponding content file 161 of the content data base 114, divides the content at a position acquired at step S241 and records the divided contents. That is, the content management program 111 generates a new content file 161 in the content data base 114, and stores the divided contents into the new content data file 161.

[0382] At step S246, the display/operation instruction program 112 generates names for the divided contents. The display/operation instruction program 112 stores the content names generated in the content data base 114 into the display data file 182. At step S247, the content management program 111 allows the content data base 114 to update the usage rule file 162 so that the maximum number of possible checkouts and number of possible checkouts for the divided contents are equal to those for the original content, and ends the operation.

[0383] If it is determined, at step S243, that the number of possible checkouts is not equal to the maximum number of possible checkouts, the operation is ended since the content cannot be divided. If it is determined, at step S244, that a playback time limit or number of times of playback is set for the content, the operation is ended since the content cannot be divided.

[0384] As in the above, the personal computer 1 can divided a content which has not been checked out, for which no playback time limit or number of times of playback is set, and which is recorded in the content data base 114. Since a content having not been checked out and for which no playback time limit or number of times of playback is set, a number of possible checkouts and a playback time limit or number of times of playback for the content will not be changed. Therefore, it is possible to prevent illegal increase of a number of possible checkouts or illegal change of a playback time limit or number of times of playback without any loss of the user's profit.

[0385] Note that it also suffices to judge whether a package to which a package to which a content to be divided belongs is a one from a CD and for which no playback time limit or number of times of playback is set, not to judge whether a playback time limit or number of times of playback is set for the content, and then divide the content if it is determined that the package to which the content belongs is from a CD.

[0386] Next, how the personal computer 1 operates when the portable device 6-1 is connected to the USB port 23-1 will be described with reference to the flow chart shown in FIG. 57. At step S261, when a starter program 117 is informed from the operating system of the personal computer 1-1 of the connection of a device to the USB port 23-1, it acquires a device ID for the device connected to the USB port 23-1 from the driver 116-1.

[0387] At step S262, the starter program 117 judges whether the portable device 6-1 is connected. If it is determined that the portable device is not connected, the starter program 117 returns to step S261 and repeatedly judges whether the portable device 6-1 is connected until the portable device 6-1 is connected.

[0388] If it is determined, at step S262, that the portable device 6-1 is connected, the starter program 117

goes to step S263 where it will judge whether the display/operation instruction program 112 has been started. If it is determined, at step S263, that the display/operation instruction program 112 has not been started, the starter program 117 goes to step S264 where it will start the display/operation instruction program 112 and go to step S265.

[0389] If it is determined, at step S263, that the display/operation instruction program 112 has been started, it is not necessary to start the display/operation instruction program 112 and so the starter program 117 will skip over step S264 to step S265.

[0390] At step S265, the display/operation instruction program 112 displays a predetermined dialog box to indicate that the portable device 6-1 is connected.

[0391] At step S266, the display/operation instruction program 112 has the content management program 111 read a name corresponding to a content stored in the portable device 6-1. At step S267, the display/operation instruction program 112 displays a field 481 in a window displayed thereby. At step S268, the display/operation instruction program 112 displays a name corresponding to a content stored in the portable device 6-1.

[0392] At step S269, the display/operation instruction program 112 judges whether it has been set to automatically check out a content to the portable device 6-1 when the latter is connected to the display/operation instruction program 112. If it is determined that it has been set to automatically check out a content to the portable device 6-1 when the latter is connected, the display/operation instruction program 112 goes to step S270 where it will check in a content stored in the portable device 6-1. Contents which can thus be checked in are limited to those having been checked out from the personal computer 1-1.

[0393] At step S271, the display/operation instruction program 112 generates a filtering package based on preset filtering data 551 stored in the filtering data file 181. At step S272, the display/operation instruction program 112 selects contents to be checked out from the generated filtering package, for example, the first ten packages.

[0394] At step S273, the display/operation instruction program 112 checks out the selected contents to the portable device 6-1. At step S274, the display/operation instruction program 112 updates the display of the field 481 correspondingly to the checkout of the contents, and ends the operation.

[0395] If it is determined, at step S269, that it has not been set to automatically check out contents to the portable device 6-1 when the latter is connected, the display/operation instruction program 112 skips over steps 270 to 274 and ends the operation since no checkout operation is required.

[0396] As in the above, when the portable device 6-1 is connected, the personal computer 1-1 can run the display/operation instruction program 112 to display names corresponding to contents stored in the portable device 6-1. Therefore, no operation is required to start the display/operation instruction program 112 and the user can quickly check out a desired content to the portable device 6-1.

[0397] If when the portable device 6-1 is connected, it has been set to automatically check out a content when the portable device 6-1 is connected to the display/operation instruction program 112, the personal computer 1-1 checks in contents stored in the portable device 6-1 while checking out a predetermined content.

[0398] Also, when the portable device 6-3 is connected to the personal computer 1-1, a similar operation to the above is effected and it will not be described any more.

[0399] It has been described in the foregoing that the display/operation instruction program 112 judges at step S269 whether it has been set to automatically check out a content when the portable device 6-1 is connected to the display/operation instruction program 112. Note however that it may be set to automatically check out a content to the portable device 6-1 when the latter is connected and the display/operation instruction program 112 may judge based on this setting whether it has been set to automatically check out a content when the portable device 6-1 is connected to the display/operation instruction program 112.

[0400] In this case, the portable device 6-1 stores at a predetermined address in an internal memory thereof a flag indicative of whether a content is automatically checked out. When the portable device 6-1 is connected, the display/operation instruction program 112 reads the flag indicative of whether a content is automatically checked out and stored at the predetermined address in the internal memory of the portable device 6-1, and judge based on the flag whether it has been set to automatically check out a content.

[0401] Further, in case the internal memory of the portable device 6-1 is removable, a flag indicative of whether a content is automatically checked out may be stored at a predetermined address in the removable memory.

[0402] Also it has been described in the above that at step S271, the display/operation instruction program 112 generates a filtering package based on the preset filtering data 551 stored in the filtering data file 181. However, the portable device 6-1 may store the filtering data 551 and the display/operation instruction program 112 may generate a filtering packaging based on the filtering data 551 stored in the portable device 6-1.

[0403] In this case, for example the portable device 6-1 stores the filtering data 551 at a predetermined address in the internal memory thereof. When the portable device 6-1 is connected, the display/operation instruction program 112 reads the filtering data 551 stored at the predetermined address in the internal memory of the portable device 6-1 and generates a filtering package based on the filtering data 551.

[0404] Further, in case the internal memory of the

portable device 6-1 is removable, the filtering data 551 may be stored at a predetermined address of the removable memory.

[0405] Also, the display/operation instruction program 112 may select a content at random, not based on the filtering data 551, and check out the selected content to the content management program 111.

[0406] Note that according to a setting made by the user, the display/operation instruction program 112 may display, in the field 348, an image indicating the level of a sound currently being outputted when a content has been played back.

[0407] Also, it should be noted that although it has previously been described that the content compression method adopted by the personal computer 1 is ATRAC3 by way of example, the method is not limited to ATRAC3 but may be any of MP3 (Moving Picture Experts Group 2 Audio Layer 3), TwinQV (trademark) , AAC (MPEG2 Advance Audio Coding), etc.

[0408] Note that although it has previously been described that the content encryption method adopted by the personal computer 1 is DES for example, the method is not limited to DES but may be any of IDEA (International Data Encryption Algorithm), RAS which is a public key encryption method, elliptical encryption, etc.

[0409] Also, the content management program 111 may be executed on a hardware provided independently inside the personal computer 1 and which cannot read directly the content management program 111, for example. Also, the hardware to execute the content management program 111 may be designed to have a tamping resistance.

[0410] The aforementioned series of operations may be executable by a hardware, but it may be executable by a software. In case the series of operations is to be executed by a software, programs composing the software is installed, from a program storage medium, into a computer incorporated in a dedicated hardware or a general-purpose personal computer, for example, whose various functions can be performed with a variety of programs installed therein.

[0411] The program storage medium to store programs installed in a computer and executable by the computer may be formed from the magnetic disc 41 or 91 (including floppy disc), optical disc 42 or 92 (including CD-ROM (compact disc read-only memory), DVD (digital versatile disc)), magneto-optical disc 43 or 93 (including MD (mini disc)), package medium such as semiconductor memory 44 or 94, ROM 12 or 62 in which the programs will be stored provisionally or permanently, or HDD 21 or 71, as shown in FIGS. 2 and 3. The programs are stored into the program storage medium via an interface such as communications unit 25 or 73 using a cable or radio communications medium such as network 2 including a local area network or Internet, or digital satellite broadcasting.

[0412] Note that the steps of operation concerning a program stored in the program storage medium, described herein, include operations which are effected time-serially in the described sequence as well as operations not effected time-serially but in parallel or individually.

[0413] Also note that the "system" referred to herein covers an entire assembly of a plurality of apparatuses.

Industrial Applicability

[0414] According to the present invention having been described in the foregoing, since a predetermined number of types of data about sound contents is recorded and other types of data about the contents than the above types of data are recorded as data which increase the types of data, it is possible to record a variety of data about contents flexibly and quickly.

Claims

1. An information processor comprising:

   a first recording means for relating a predetermined number of types of data about a first content as a first main data group with the first content and recording the data; and
   a second recording means for relating data of types other than the first main data group about the first content and recording in a sub data group;
   the first recording means relating a predetermined number of types of data about the second content as a second main data group with the second content and recording the data, and
   the second recording means relating data of types other than the second main data group about the second content with the second content and recording the data in the sub data group.

2. The apparatus according to claim 1, wherein the second recording means records the usage rule for the contents as the other types of data.

3. The apparatus according to claim 1, wherein the second recording means records, as the other types of data, data used to control a device using the contents

4. The apparatus according to claim 1, further comprising:

   means for judging, when reading data about a content, whether the type of data to be read is that of data recorded in either the main data group or sub data group; and
   means for searching for data from a plurality of main data groups or sub data groups based on

the result of the search made by the data searching means.

5. An information processing method comprising:

a first recording step of relating a predetermined number of types of data about a first content as a first main data group with the first content and recording the data; and
a second recording step of relating data of types other than the first main data group about the first content and recording in a sub data group;
a predetermined number of types of data about the second content being related as a second main data group with the second content and recorded at the first recording step; and
data of types other than the second main data group about the second content being related with the second content and recorded in the sub data group at the second recording step.

6. The method according to claim 5, further comprising:

a judging step of judging, when reading data about a content, whether the type of data to be read is that of data recorded in either the main data group or sub data group; and
a data searching step of searching for data from a plurality of main data groups or sub data groups based on the result of the search made at the data searching step.

7. A program storage medium having stored therein a computer-readable program for use in the above information processing apparatus and method, the program comprising:

a first recording step of relating a predetermined number of types of data about a first content as a first main data group with the first content and recording the data; and
a second recording step of relating data of types other than the first main data group about the first content and recording the data in a sub data group;
a predetermined number of types of data about the second content being related as a second main data group with the second content and recorded at the first recording step; and
data of types other than the second main data group about the second content being related with the second content and recorded in the sub data group at the second recording step.

8. The medium according to claim 7, the program further comprising:

a judging step of judging, when reading data about a content, whether the type of data to be read is that of data recorded in either the main data group or sub data group; and
a data searching step of searching for data from a plurality of main data groups or sub data groups based on the result of the search made at the data searching step.

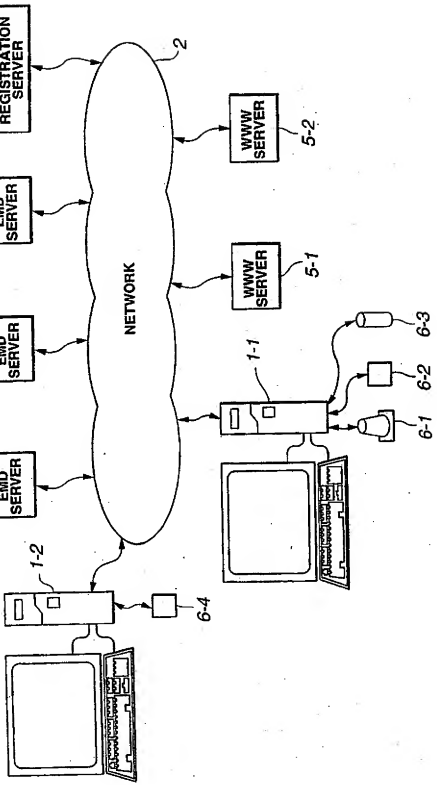
3
EMD REGISTRATION SERVER
2
NETWORK
4-3
EMD SERVER
WWW SERVER
5-2
4-2
EMD SERVER
WWW SERVER
5-1
4-1
EMD SERVER
1-1
1-2
6-1
6-2
6-3
6-4

FIG.1

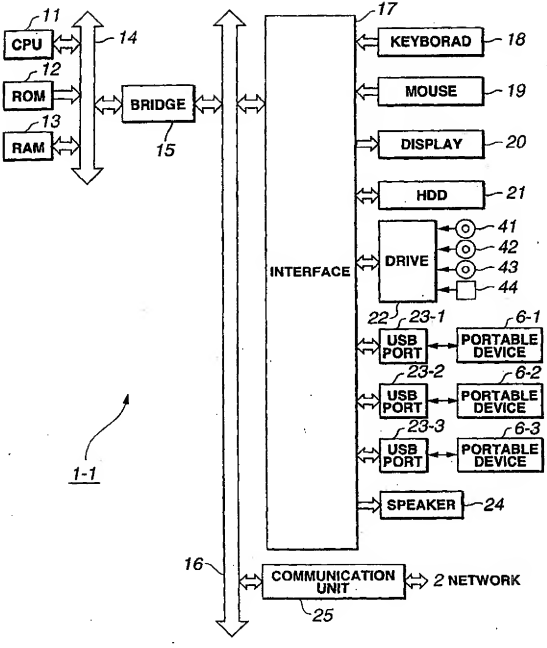
11
CPU
14
12
ROM
BRIDGE
13
RAM
15
17
KEYBORAD
18
MOUSE
19
DISPLAY
20
HDD
21
41
42
43
44
DRIVE
INTERFACE
22
23-1
USB PORT
6-1
PORTABLE DEVICE
23-2
USB PORT
6-2
PORTABLE DEVICE
23-3
USB PORT
6-3
PORTABLE DEVICE
SPEAKER
24
1-1
16
COMMUNICATION UNIT
2 NETWORK
25

FIG.2

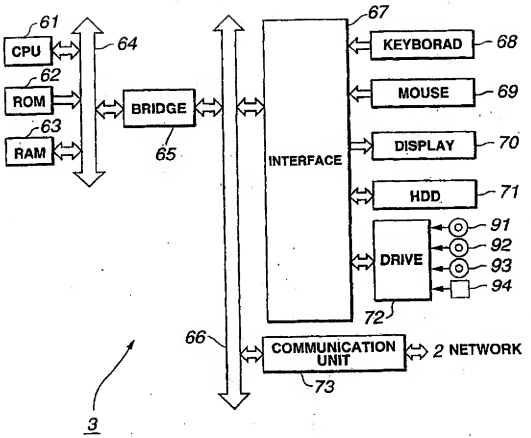
61
CPU
64
62
ROM
BRIDGE
63
RAM
65
67
KEYBORAD
68
MOUSE
69
INTERFACE
DISPLAY
70
HDD
71
91
92
DRIVE
93
94
72
66
COMMUNICATION UNIT
2 NETWORK
73
3

FIG.3

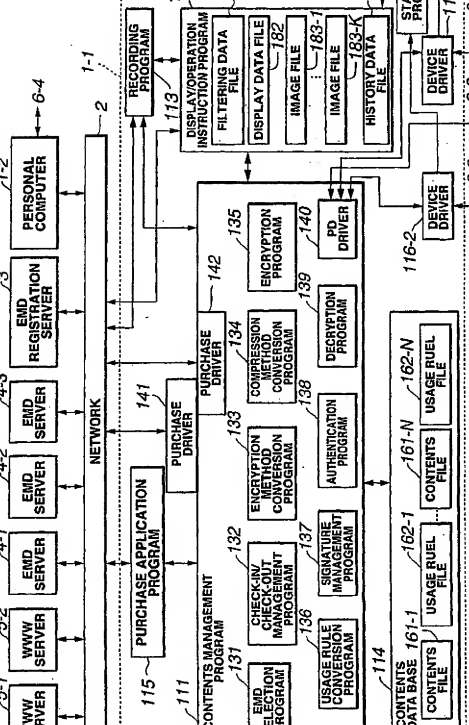
WWW SERVER
5-1
WWW SERVER
5-2
EMD SERVER
4-1
EMD SERVER
4-2
EMD SERVER
4-3
EMD REGISTRATION SERVER
3
PERSONAL COMPUTER
1-2
6-4
1-1
NETWORK
2
RECORDING PROGRAM
112
DISPLAY/OPERATION INSTRUCTION PROGRAM
113
FILTERING DATA FILE
181
DISPLAY DATA FILE
182
IMAGE FILE
183-1
IMAGE FILE
183-K
HISTORY DATA FILE
184
117
STARTING PROGRAM
DEVICE DRIVER
116-1
PORTABLE DEVICE
6-1
PORTABLE DEVICE
6-2
PORTABLE DEVICE
6-3
DEVICE DRIVER
116-2
PURCHASE APPLICATION PROGRAM
115
PURCHASE DRIVER
141
PURCHASE DRIVER
142
CONTENTS MANAGEMENT PROGRAM
111
EMD SELECTION PROGRAM
131
CHECK-IN/ CHECK-OUT MANAGEMENT PROGRAM
132
ENCRYPTION METHOD CONVERSION PROGRAM
133
COMPRESSION METHOD CONVERSION PROGRAM
134
ENCRYPTION PROGRAM
135
USAGE RULE CONVERSION PROGRAM
136
SIGNATURE MANAGEMENT PROGRAM
137
AUTHENTICATION PROGRAM
138
DECRYPTION PROGRAM
139
PD DRIVER
140
CONTENTS DATA BASE
114
CONTENTS FILE
161-1
USAGE RUEL FILE
162-1
CONTENTS FILE
161-N
USAGE RUEL FILE
162-N

FIG.4

CONTENTS ID	CHECKOUT POSSIBLE ?	NUMBER OF MAXIMUM POSSIBLE CHECKOUTS	NUMBER OF POSSIBLE CHECKOUTS	MOVE POSSIBLE ?	COPY POSSIBLE ?	NUMBER OF POSSIBLE COPIES	USAGE PERIOD		CONTENT-USABLE DISTRICT	SIGNATURE
							START DATE	END DATE		
123×DES3	YES	3	3	NO	NO	—	99.11. 1	99.12. 3	JAPAN	XXYYSBYE

FIG.5

EP 1 154 404 A1

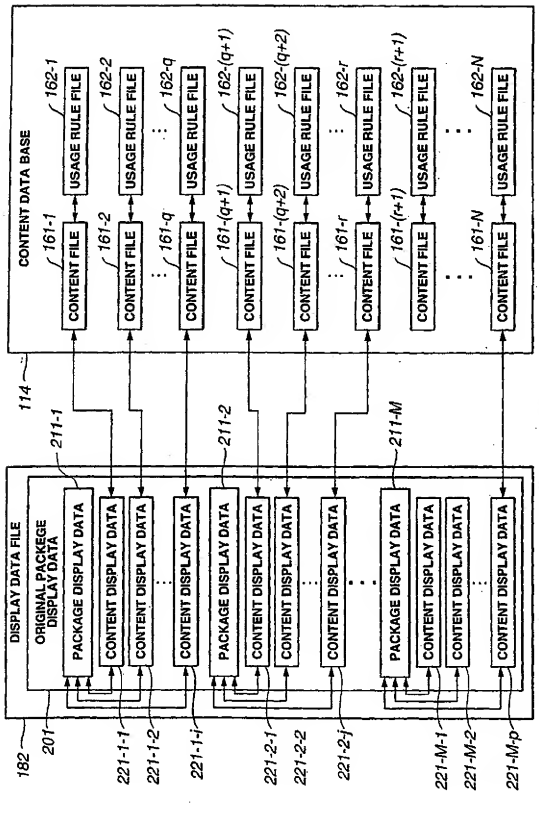
182
DISPLAY DATA FILE
201
ORIGINAL PACKEGE DISPLAY DATA
PACKAGE DISPLAY DATA
CONTENT DISPLAY DATA
211-1
221-1-1
221-1-2
221-1-i
211-2
221-2-1
221-2-2
221-2-j
211-M
221-M-1
221-M-2
221-M-p
114
CONTENT DATA BASE
161-1
161-2
161-q
161-(q+1)
161-(q+2)
161-r
161-(r+1)
161-N
CONTENT FILE
162-1
162-2
162-q
162-(q+1)
162-(q+2)
162-r
162-(r+1)
162-N
USAGE RULE FILE

FIG.6

PACKAGE ID	PACKAGE TYPE	PACKAGE SOURCE	PACKAGE NAME	ARTIST NAME	GENRE NAME	PLAY TIME	REGISTRATION DATA	CORRESPONDING IMAGE FILE
PPP753	ORIGINAL	CD	FIRST	A. TARO	POP	54:23:00	99.11. 1	CoverArt1.JPG
ID FOR CONTENT BELONGING TO PACKAGE								
123×DES3	123×DES4	123×DES5	123×DES6	123×DES7	123×DES8	123×DES9	123×DES0	123×DET1

FIG.7A

FIG.7B

CONTENT ID	ORIGINAL PACKAGE	CONTENT NAME	NUMBER OF POSSIBLE CHECKOUTS	NUMBER OF MAXIMUM POSSIBLE CHECKOUTS	PLAY TIME	CORRESPONDING IMAGE FILE
123×DES3	PPP753	MINAMI-NO-SAKABA	3	3	3:05	CoverArt2.jpg

FIG.7C

CONTENT ID	DATA TYPE	DATA
123×DES3	CYBER CODE	XXXYYY
123×DES3	ISRC CODE	ZZZZZZZ
123×DES3	SONGWRITER NAME	ABE
123×DES3	COMPOSER NAME	KATO
123×DES4	CYBER CODE	DDDDKK
123×DES4	ISRC	ZZZZZZZ
123×DES4	REPRODUCTION PERIOD	99.12.31
123×DES4	NUMBER OF REPRODUCTION	15
123×DES4	EQUALIZER INFORMATION	ααα. ββββ. γγγ
⋮	⋮	⋮

EP 1 154 404 A1

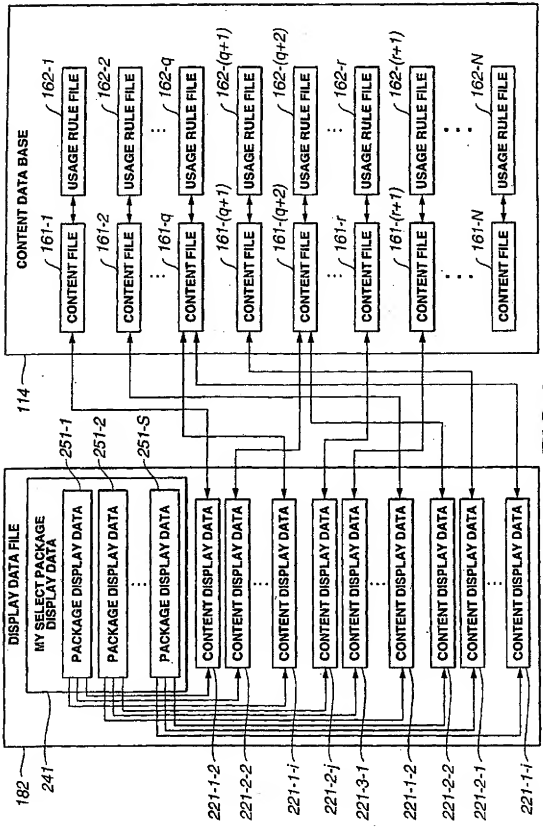
182
241
DISPLAY DATA FILE
MY SELECT PACKAGE DISPLAY DATA
PACKAGE DISPLAY DATA
PACKAGE DISPLAY DATA
PACKAGE DISPLAY DATA
251-1
251-2
251-S
CONTENT DISPLAY DATA
114
CONTENT DATA BASE
161-1
161-2
161-q
161-(q+1)
161-(q+2)
161-r
161-(r+1)
161-N
CONTENT FILE
162-1
162-2
162-q
162-(q+1)
162-(q+2)
162-r
162-(r+1)
162-N
USAGE RULE FILE
221-1-2
221-2-2
221-1-i
221-2-j
221-3-1
221-1-2
221-2-2
221-2-1
221-1-i

FIG.8

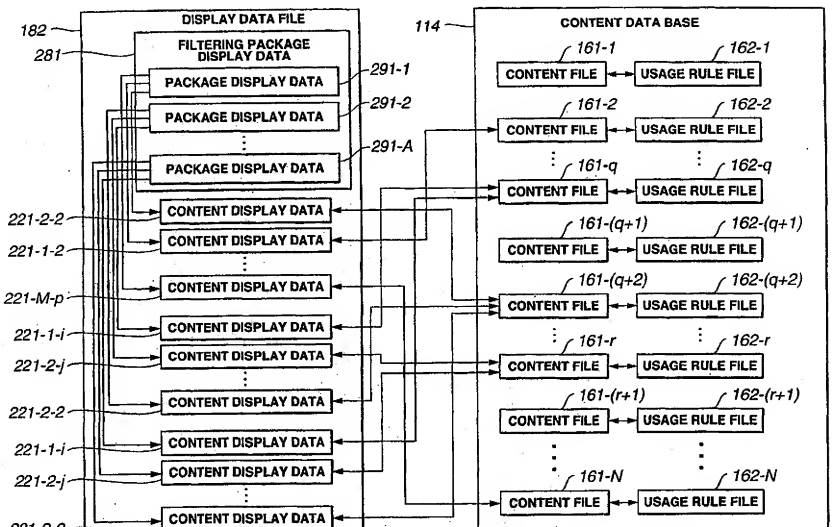

FIG.9

EP 1 154 404 A1

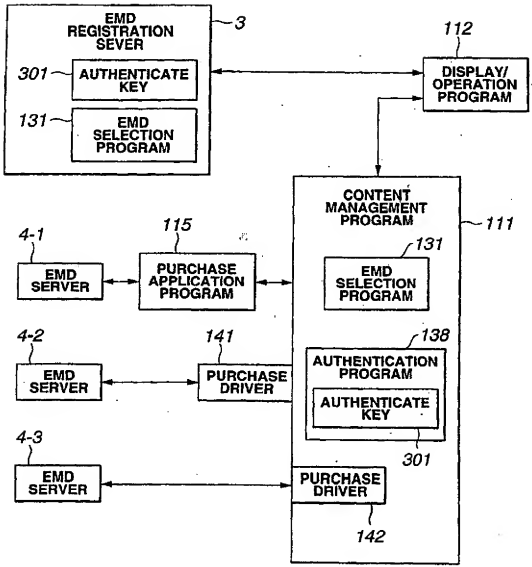
EMD REGISTRATION SEVER
3
301
AUTHENTICATE KEY
131
EMD SELECTION PROGRAM
112
DISPLAY/ OPERATION PROGRAM
CONTENT MANAGEMENT PROGRAM
111
131
EMD SELECTION PROGRAM
4-1
EMD SERVER
115
PURCHASE APPLICATION PROGRAM
4-2
EMD SERVER
141
PURCHASE DRIVER
138
AUTHENTICATION PROGRAM
AUTHENTICATE KEY
301
4-3
EMD SERVER
PURCHASE DRIVER
142

FIG.10

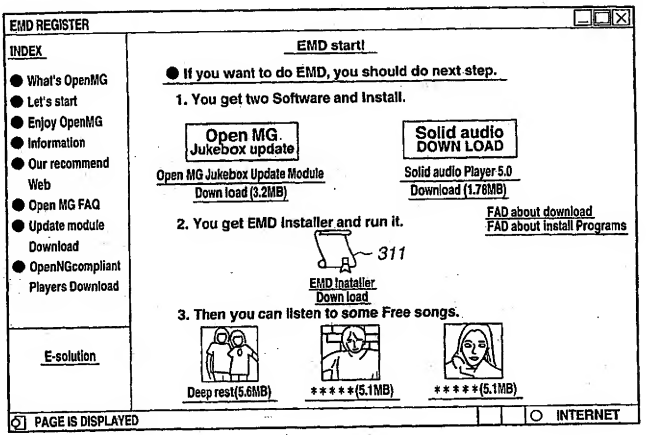

FIG.11

EP 1 154 404 A1

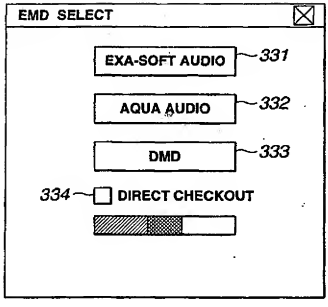
EMD SELECT
EXA-SOFT AUDIO
331
AQUA AUDIO
332
DMD
333
334
DIRECT CHECKOUT

FIG.12

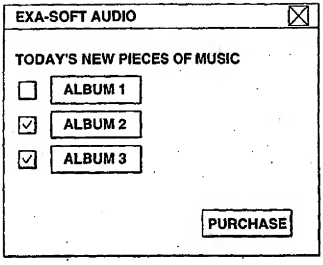
EXA-SOFT AUDIO
TODAY'S NEW PIECES OF MUSIC
ALBUM 1
ALBUM 2
ALBUM 3
PURCHASE

FIG.13

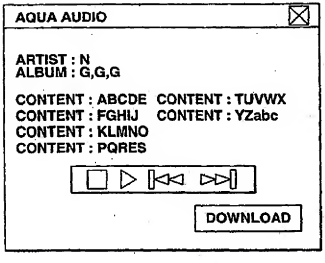
AQUA AUDIO
ARTIST : N
ALBUM : G,G,G
CONTENT : ABCDE
CONTENT : FGHIJ
CONTENT : KLMNO
CONTENT : PQRES
CONTENT : TUVWX
CONTENT : YZabc
DOWNLOAD

FIG.14

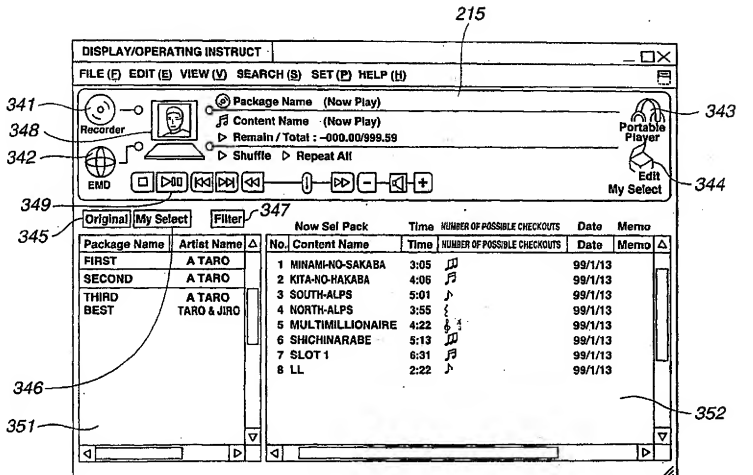

FIG.15

EP 1 154 404 A1

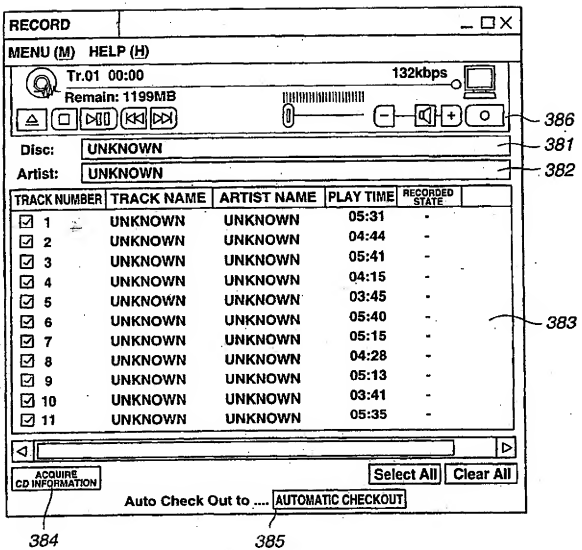
RECORD
MENU (M) HELP (H)
Tr.01 00:00
Remain: 1199MB
132kbps
386
Disc: UNKNOWN
381
Artist: UNKNOWN
382
TRACK NUMBER | TRACK NAME | ARTIST NAME | PLAY TIME | RECORDED STATE
1 UNKNOWN UNKNOWN 05:31 -
2 UNKNOWN UNKNOWN 04:44 -
3 UNKNOWN UNKNOWN 05:41 -
4 UNKNOWN UNKNOWN 04:15 -
5 UNKNOWN UNKNOWN 03:45 -
6 UNKNOWN UNKNOWN 05:40 -
7 UNKNOWN UNKNOWN 05:15 -
8 UNKNOWN UNKNOWN 04:28 -
9 UNKNOWN UNKNOWN 05:13 -
10 UNKNOWN UNKNOWN 03:41 -
11 UNKNOWN UNKNOWN 05:35 -
383
ACQUIRE CD INFORMATION
Select All
Clear All
Auto Check Out to ....
AUTOMATIC CHECKOUT
384
385

FIG.16

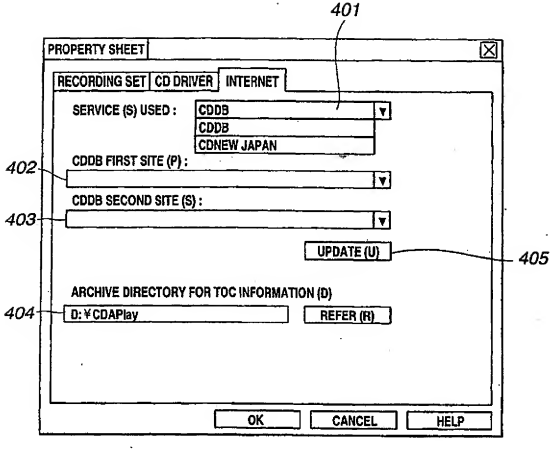
401
PROPERTY SHEET
RECORDING SET
CD DRIVER
INTERNET
SERVICE (S) USED :
CDDB
CDDB
CDNEW JAPAN
402
CDDB FIRST SITE (P) :
403
CDDB SECOND SITE (S) :
UPDATE (U)
405
ARCHIVE DIRECTORY FOR TOC INFORMATION (D)
404
D:¥CDAPlay
REFER (R)
OK
CANCEL
HELP

FIG.17

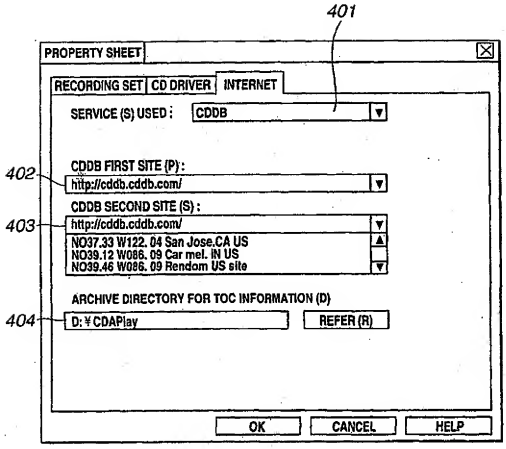
401
PROPERTY SHEET
RECORDING SET
CD DRIVER
INTERNET
SERVICE (S) USED :
CDDB
402
CDDB FIRST SITE (P) :
http://cddb.cddb.com/
403
CDDB SECOND SITE (S) :
http://cddb.cddb.com/
NO37.33 W122. 04 San Jose.CA US
NO39.12 W086. 09 Car mel. IN US
NO39.46 W086. 09 Rendom US site
ARCHIVE DIRECTORY FOR TOC INFORMATION (D)
404
D:¥CDAPlay
REFER (R)
OK
CANCEL
HELP

FIG.18

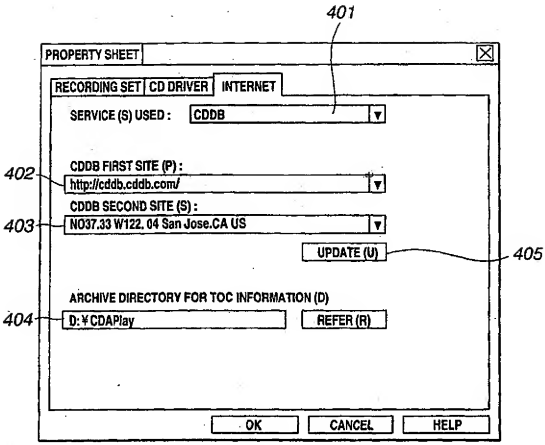
401
PROPERTY SHEET
RECORDING SET
CD DRIVER
INTERNET
SERVICE (S) USED :
CDDB
402
CDDB FIRST SITE (P) :
http://cddb.cddb.com/
403
CDDB SECOND SITE (S) :
N037.33 W122. 04 San Jose.CA US
UPDATE (U)
405
ARCHIVE DIRECTORY FOR TOC INFORMATION (D)
404
D:¥CDAPlay
REFER (R)
OK
CANCEL
HELP

FIG.19

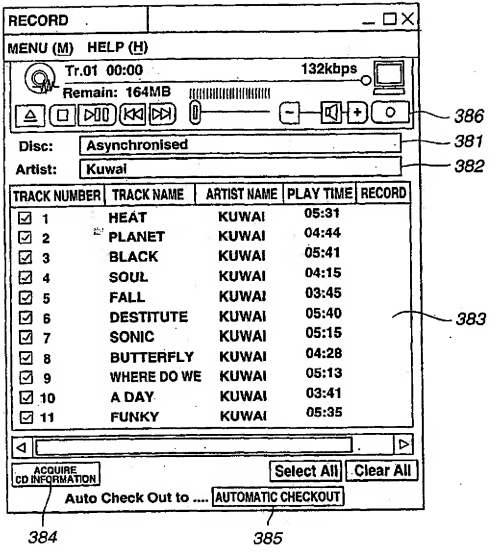
RECORD
MENU (M) HELP (H)
Tr.01 00:00
132kbps
Remain: 164MB
386
Disc: Asynchronised
381
Artist: Kuwai
382
TRACK NUMBER
TRACK NAME
ARTIST NAME
PLAY TIME
RECORD
1 HEAT KUWAI 05:31
2 PLANET KUWAI 04:44
3 BLACK KUWAI 05:41
4 SOUL KUWAI 04:15
5 FALL KUWAI 03:45
6 DESTITUTE KUWAI 05:40
7 SONIC KUWAI 05:15
8 BUTTERFLY KUWAI 04:28
9 WHERE DO WE KUWAI 05:13
10 A DAY KUWAI 03:41
11 FUNKY KUWAI 05:35
383
ACQUIRE CD INFORMATION
Select All
Clear All
Auto Check Out to ....
AUTOMATIC CHECKOUT
384
385

FIG.20

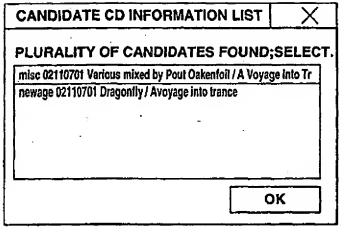
CANDIDATE CD INFORMATION LIST
PLURALITY OF CANDIDATES FOUND;SELECT.
misc 02110701 Various mixed by Pout Oakenfoil / A Voyage Into Tr
newage 02110701 Dragonfly / Avoyage into trance
OK

FIG.21

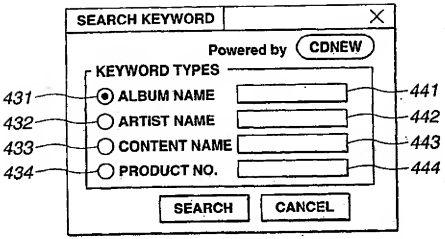
SEARCH KEYWORD
Powered by CDNEW
KEYWORD TYPES
431
ALBUM NAME
441
432
ARTIST NAME
442
433
CONTENT NAME
443
434
PRODUCT NO.
444
SEARCH
CANCEL

FIG.22

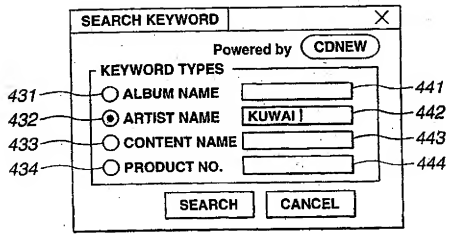
SEARCH KEYWORD
Powered by CDNEW
KEYWORD TYPES
431
ALBUM NAME
441
432
ARTIST NAME
KUWAI
442
433
CONTENT NAME
443
434
PRODUCT NO.
444
SEARCH
CANCEL

FIG.23

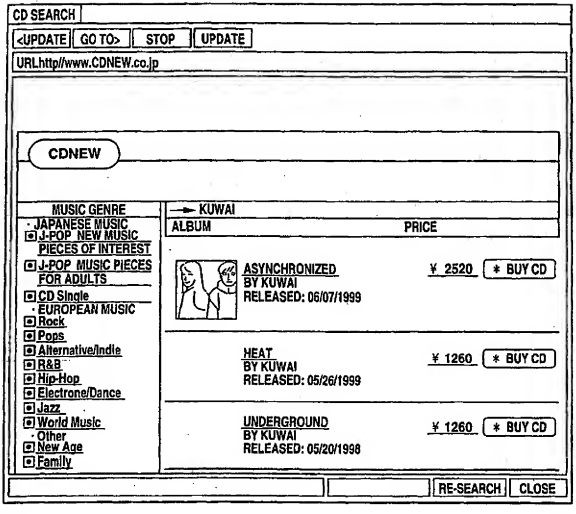
CD SEARCH
<UPDATE
GO TO>
STOP
UPDATE
URL:http//www.CDNEW.co.jp
CDNEW
MUSIC GENRE
· JAPANESE MUSIC
J-POP NEW MUSIC
PIECES OF INTEREST
J-POP MUSIC PIECES
FOR ADULTS
CD Single
· EUROPEAN MUSIC
Rock
Pops
Alternative/Indie
R&B
Hip-Hop
Electrone/Dance
Jazz
World Music
· Other
New Age
Family
KUWAI
ALBUM
PRICE
ASYNCHRONIZED
BY KUWAI
RELEASED: 06/07/1999
¥ 2520
* BUY CD
HEAT
BY KUWAI
RELEASED: 05/26/1999
¥ 1260
* BUY CD
UNDERGROUND
BY KUWAI
RELEASED: 05/20/1998
¥ 1260
* BUY CD
RE-SEARCH
CLOSE

FIG.24

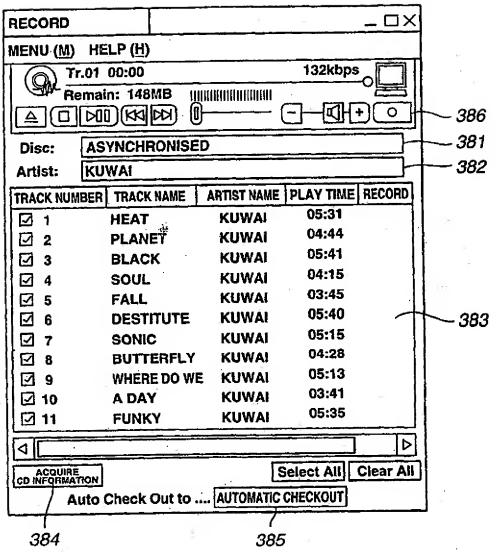
RECORD
MENU (M) HELP (H)
Tr.01 00:00
132kbps
Remain: 148MB
386
Disc: ASYNCHRONISED
381
Artist: KUWAI
382
TRACK NUMBER | TRACK NAME | ARTIST NAME | PLAY TIME | RECORD
1 HEAT KUWAI 05:31
2 PLANET KUWAI 04:44
3 BLACK KUWAI 05:41
4 SOUL KUWAI 04:15
5 FALL KUWAI 03:45
6 DESTITUTE KUWAI 05:40
7 SONIC KUWAI 05:15
8 BUTTERFLY KUWAI 04:28
9 WHERE DO WE KUWAI 05:13
10 A DAY KUWAI 03:41
11 FUNKY KUWAI 05:35
383
ACQUIRE CD INFORMATION
Select All
Clear All
Auto Check Out to ....
AUTOMATIC CHECKOUT
384
385

FIG.25

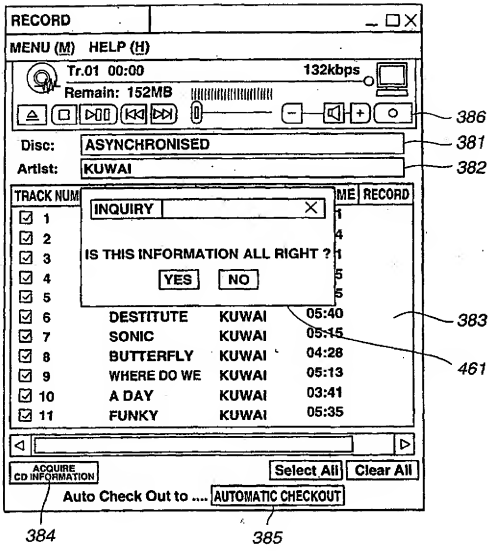
RECORD
MENU (M) HELP (H)
Tr.01 00:00
132kbps
Remain: 152MB
386
Disc: ASYNCHRONISED
381
Artist: KUWAI
382
TRACK NUM
ME
RECORD
INQUIRY
IS THIS INFORMATION ALL RIGHT ?
YES
NO
1
4
1
5
5
6 DESTITUTE KUWAI 05:40
383
7 SONIC KUWAI 05:15
461
8 BUTTERFLY KUWAI 04:28
9 WHERE DO WE KUWAI 05:13
10 A DAY KUWAI 03:41
11 FUNKY KUWAI 05:35
ACQUIRE CD INFORMATION
Select All
Clear All
Auto Check Out to ....
AUTOMATIC CHECKOUT
384
385

FIG.26

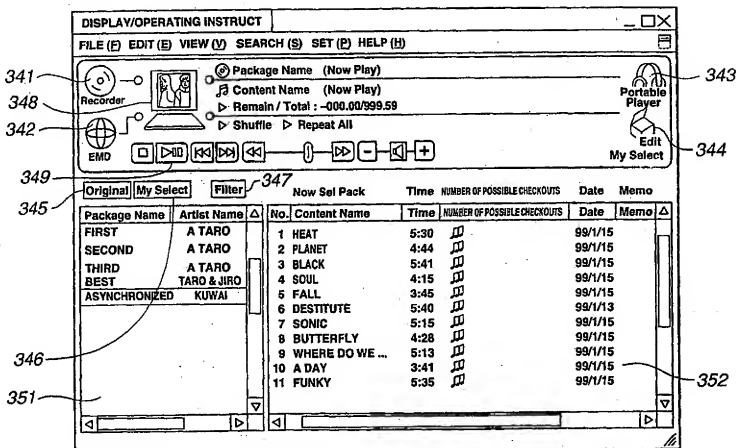

FIG.27

EP 1 154 404 A1

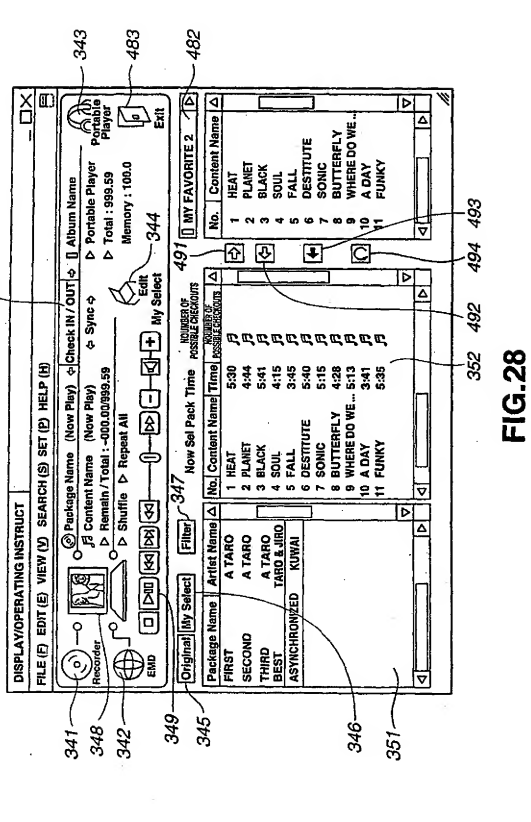
DISPLAY/OPERATING INSTRUCT
FILE (F) EDIT (E) VIEW (V) SEARCH (S) SET (P) HELP (H)
Recorder
Package Name (Now Play)
Content Name (Now Play)
Remain / Total : -000.00/999.59
Shuffle
Repeat All
Check IN / OUT
Sync
Total : 999.59
Memory : 100.0
Edit
My Select
Portable Player
Exit
END
Original
My Select
Filter
Now Sel Pack Time
NUMBER OF POSSIBLE SELECTIONS
REMAINING POSSIBLE SELECTIONS
Package Name
Artist Name
No.
Content Name
Time
FIRST
SECOND
THIRD
BEST
ASYNCHRONIZED
A TARO
TARO & JIRO
KUWAI
1 HEAT 5:30
2 PLANET 4:44
3 BLACK 5:41
4 SOUL 4:15
5 FALL 3:45
6 DESTITUTE 5:40
7 SONIC 5:15
8 BUTTERFLY 4:28
9 WHERE DO WE... 5:13
10 A DAY 3:41
11 FUNKY 5:35
MY FAVORITE 2
No.
Content Name
1 HEAT
2 PLANET
3 BLACK
4 SOUL
5 FALL
6 DESTITUTE
7 SONIC
8 BUTTERFLY
9 WHERE DO WE...
10 A DAY
11 FUNKY
341
348
342
349
345
346
351
352
492
494
493
491
344
347
343
483
482
484

FIG.28

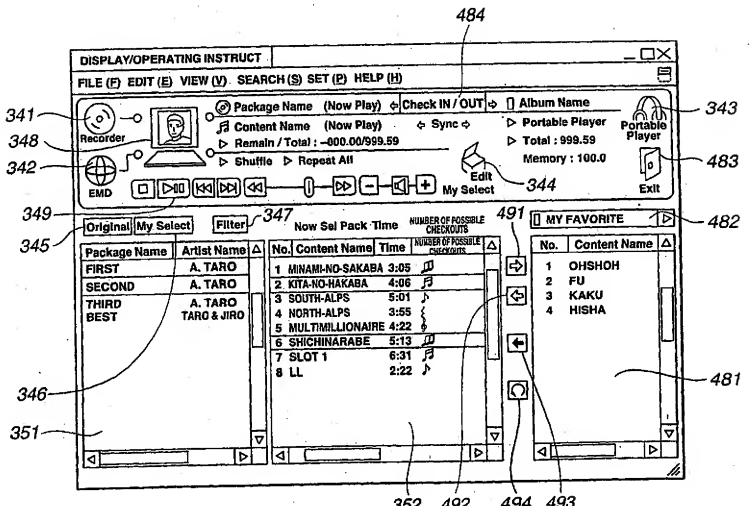

FIG.29

EP 1 154 404 A1

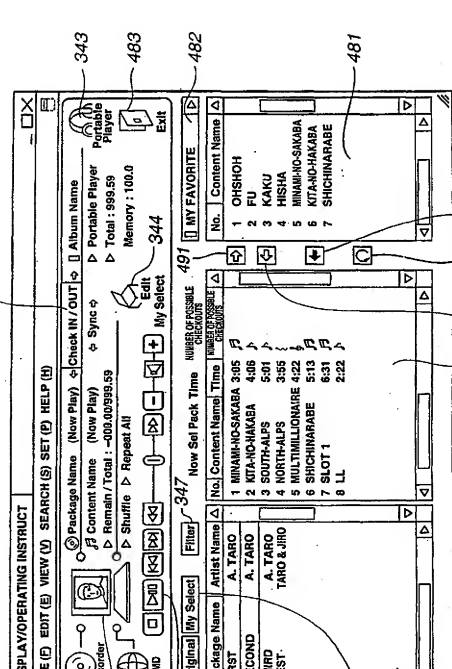
DISPLAY/OPERATING INSTRUCT
FILE (F) EDIT (E) VIEW (V) SEARCH (S) SET (F) HELP (H)
Package Name (Now Play)
Content Name (Now Play)
Remain / Total : -000.00/999.59
Shuffle
Repeat All
Recorder
END
Check IN / OUT
Sync
Album Name
Portable Player
Total : 999.59
Memory : 100.0
Edit
My Select
Exit
Original
My Select
Filter
Now Sel Pack Time
NUMBER OF POSSIBLE CHECKOUTS
MY FAVORITE
Package Name
Artist Name
No.
Content Name
Time
FIRST
SECOND
THIRD
BEST
A. TARO
A. TARO
A. TARO
TARO & JIRO
1 MINAMI-NO-SAKABA 3:05
2 KITA-NO-HAKABA 4:06
3 SOUTH-ALPS 5:01
4 NORTH-ALPS 3:55
5 MULTIMILLIONAIRE 4:22
6 SHICHINARABE 5:13
7 SLOT 1 6:31
8 LL 2:22
1 OHSHOH
2 FU
3 KAKU
4 HISHA
5 MINAMI-NO-SAKABA
6 KITA-NO-HAKABA
7 SHICHINARABE
341
342
343
344
345
346
347
348
349
351
352
481
482
483
484
491
492
493
494

FIG.30

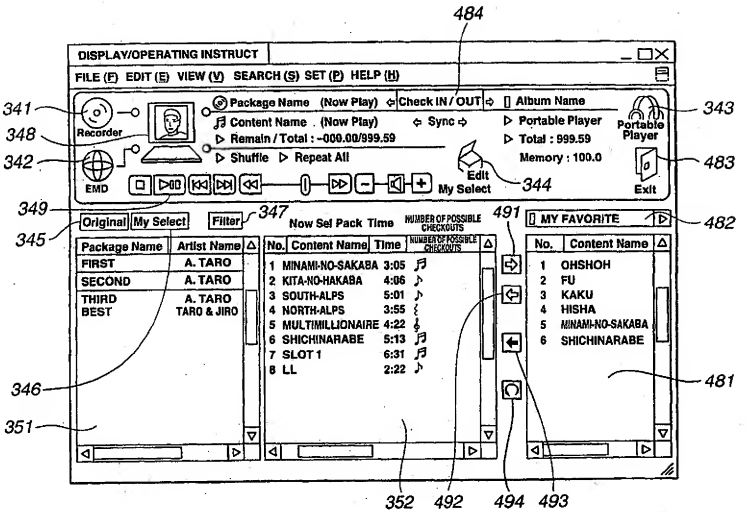

FIG.31

EP 1 154 404 A1

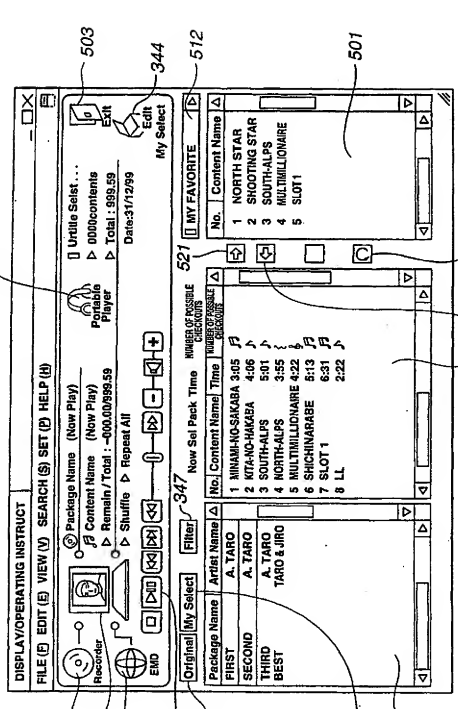
DISPLAY/OPERATING INSTRUCT
FILE (F) EDIT (E) VIEW (V) SEARCH (S) SET (P) HELP (H)
Package Name (Now Play)
Content Name (Now Play)
Remain/Total : -000.00/999.59
Shuffle
Repeat All
Recorder
EMD
Portable Player
Untitle Selst . . .
0000contents
Total : 999.59
Date:31/12/99
Exit
Edit
My Select
Original
My Select
Filter
Now Sel Pack Time
NUMBER OF POSSIBLE SELECTIONS
NUMBER OF POSSIBLE RECORDS
MY FAVORITE
Package Name
Artist Name
No.
Content Name
Time
No.
Content Name
FIRST
A. TARO
SECOND
A. TARO
THIRD
A. TARO
BEST
TARO & JIRO
1 NINAMI-NO-SAKABA 3:05
2 KITA-NO-HAKABA 4:06
3 SOUTH-ALPS 5:01
4 NORTH-ALPS 3:55
5 MULTIMILLIONAIRE 4:22
6 SHICHINARABE 5:13
7 SLOT 1 6:31
8 LL 2:22
1 NORTH STAR
2 SHOOTING STAR
3 SOUTH-ALPS
4 MULTIMILLIONAIRE
5 SLOT 1
341
348
342
349
345
346
351
343
347
352
521
522
523
503
344
512
501

FIG.32

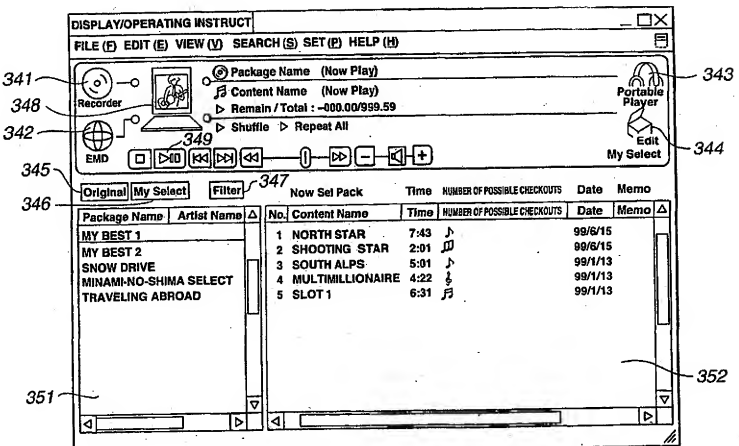

FIG.33

EP 1 154 404 A1

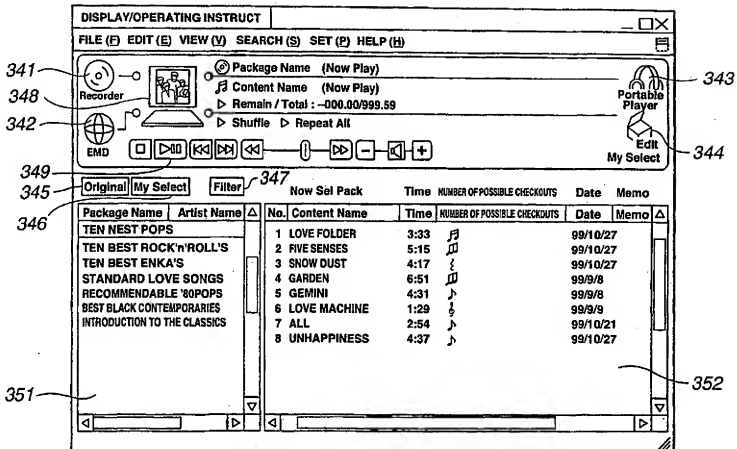

FIG.34

EP 1 154 404 A1

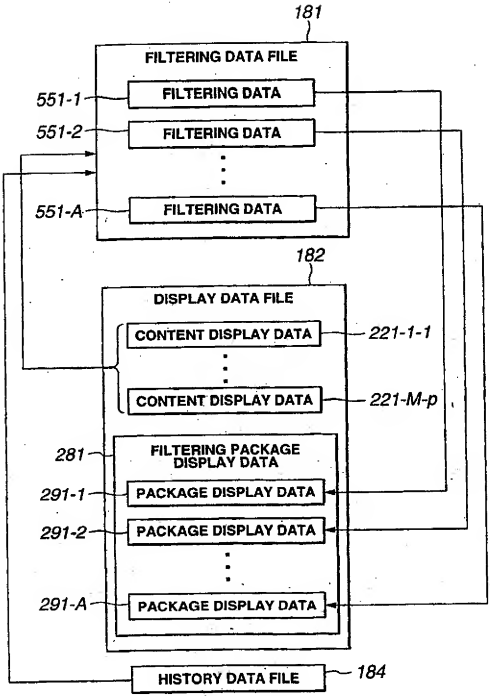
181
FILTERING DATA FILE
551-1
FILTERING DATA
551-2
FILTERING DATA
551-A
FILTERING DATA
182
DISPLAY DATA FILE
CONTENT DISPLAY DATA
221-1-1
CONTENT DISPLAY DATA
221-M-p
281
FILTERING PACKAGE DISPLAY DATA
291-1
PACKAGE DISPLAY DATA
291-2
PACKAGE DISPLAY DATA
291-A
PACKAGE DISPLAY DATA
HISTORY DATA FILE
184

FIG.35

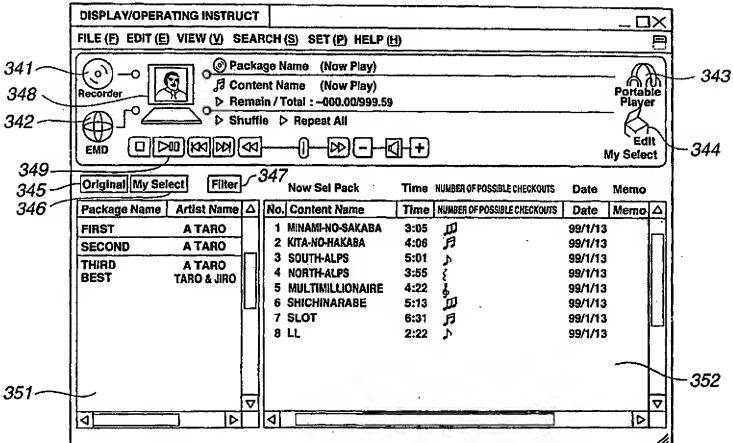

FIG.36

EP 1 154 404 A1

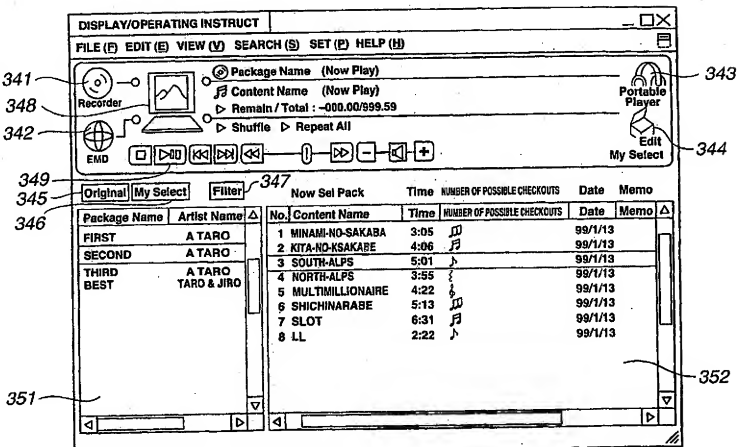

FIG.37

EP 1 154 404 A1

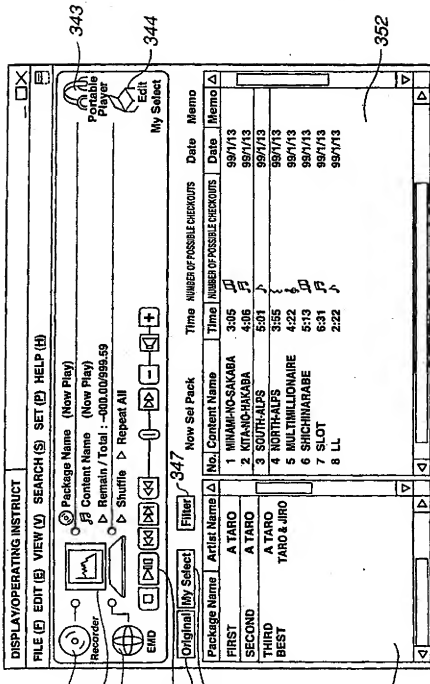
DISPLAY/OPERATING INSTRUCT
FILE (F) EDIT (E) VIEW (V) SEARCH (S) SET (P) HELP (H)
Package Name (Now Play)
Content Name (Now Play)
Remain /Total : -000.00/999.59
Shuffle Repeat All
Recorder
EMD
Portable Player
Edit
My Select
Original
My Select
Filter
Now Sel Pack
Time
NUMBER OF POSSIBLE CHECKOUTS
Date
Memo
Package Name
Artist Name
No.
Content Name
FIRST A TARO
SECOND A TARO
THIRD A TARO
BEST TARO & JIRO
1 MINAMI-NO-SAKABA 3:05 99/1/13
2 KITANO-HAKABA 4:06 99/1/13
3 SOUTH-ALPS 5:01 99/1/13
4 NORTH-ALPS 3:55 99/1/13
5 MULTIMILLIONAIRE 4:22 99/1/13
6 SHICHINARABE 5:13 99/1/13
7 SLOT 6:31 99/1/13
8 LL 2:22 99/1/13
341
342
343
344
345
346
347
348
349
351
352

FIG.38

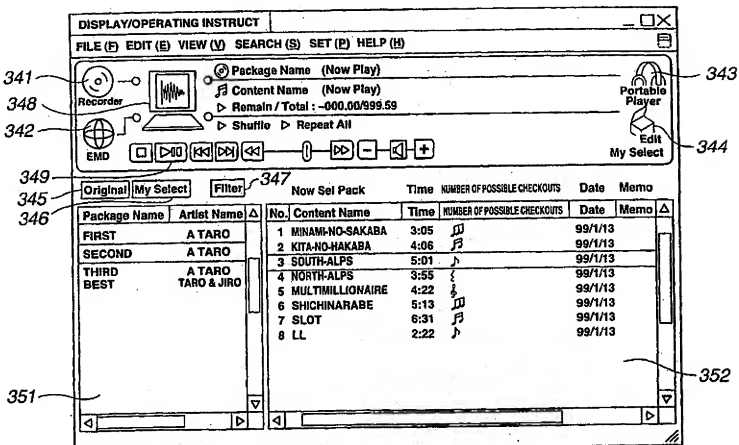
DISPLAY/OPERATING INSTRUCT
FILE (F) EDIT (E) VIEW (V) SEARCH (S) SET (P) HELP (H)
341
Recorder
348
342
EMD
Package Name (Now Play)
Content Name (Now Play)
Remain / Total : -000.00/999.59
Shuffle Repeat All
343
Portable Player
Edit
My Select
344
349
Original
My Select
345
346
Filter
347
Now Sel Pack
Time
NUMBER OF POSSIBLE CHECKOUTS
Date
Memo
Package Name
Artist Name
FIRST A TARO
SECOND A TARO
THIRD A TARO
BEST TARO & JIRO
No.
Content Name
Time
Date
Memo
1 MINAMI-NO-SAKABA 3:05 99/1/13
2 KITA-NO-NAKABA 4:06 99/1/13
3 SOUTH-ALPS 5:01 99/1/13
4 NORTH-ALPS 3:55 99/1/13
5 MULTIMILLIONAIRE 4:22 99/1/13
6 SHICHINARABE 5:13 99/1/13
7 SLOT 6:31 99/1/13
8 LL 2:22 99/1/13
351
352

FIG.39

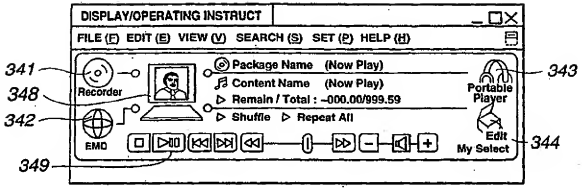
DISPLAY/OPERATING INSTRUCT
FILE (F) EDIT (E) VIEW (V) SEARCH (S) SET (P) HELP (H)
341
Recorder
348
342
EMD
349
Package Name (Now Play)
Content Name (Now Play)
Remain / Total : -000.00/999.59
Shuffle Repeat All
343
Portable Player
Edit My Select
344

FIG.40

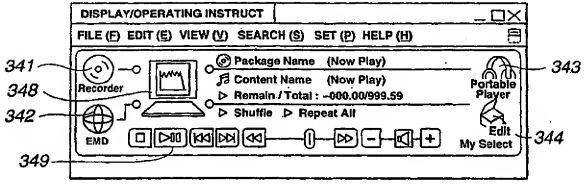
DISPLAY/OPERATING INSTRUCT
FILE (F) EDIT (E) VIEW (V) SEARCH (S) SET (P) HELP (H)
341
Recorder
348
342
EMD
349
Package Name (Now Play)
Content Name (Now Play)
Remain / Total : -000.00/999.59
Shuffle Repeat All
343
Portable Player
Edit My Select
344

FIG.41

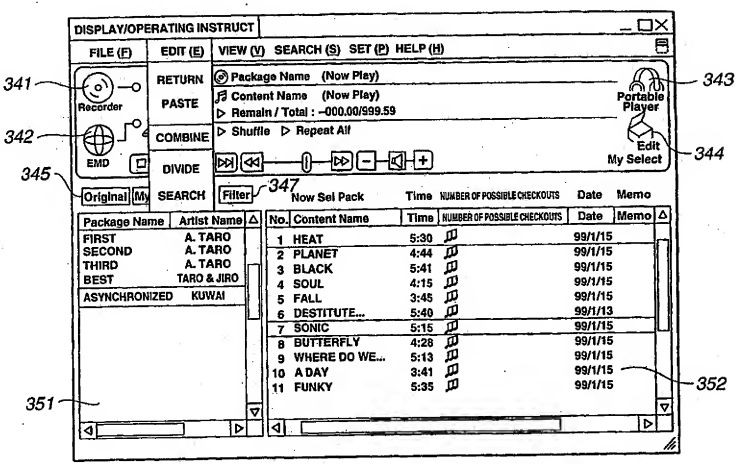

FIG.42

EP 1 154 404 A1

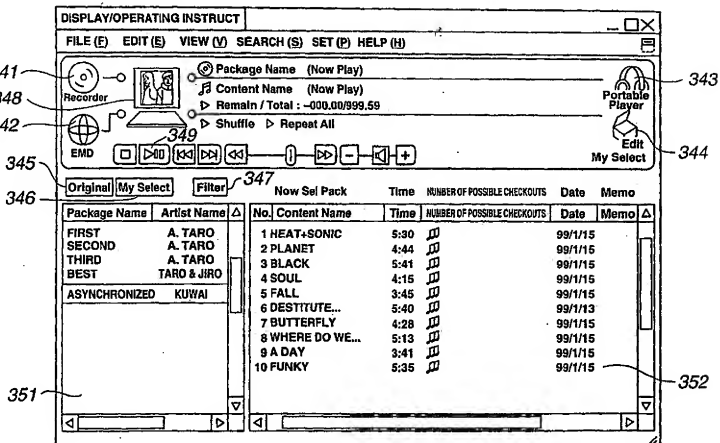

FIG.43

EP 1 154 404 A1

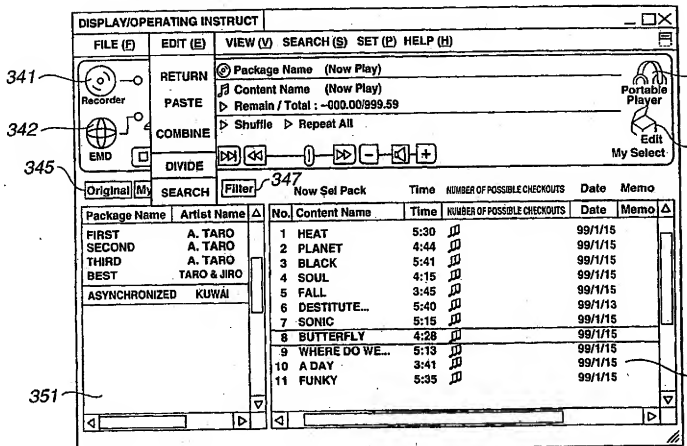

FIG.44

EP 1 154 404 A1

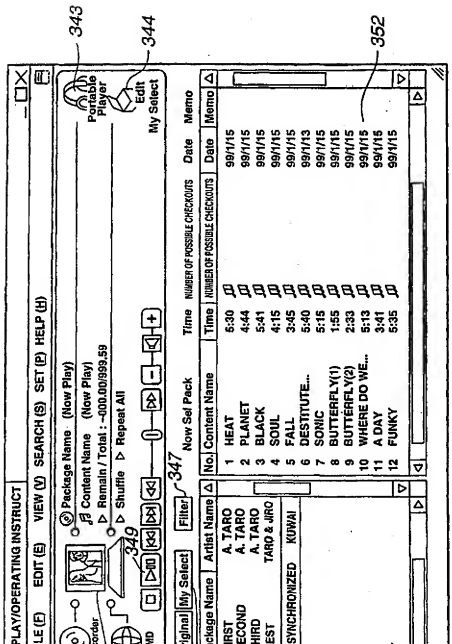
DISPLAY/OPERATING INSTRUCT
FILE (F) EDIT (E) VIEW (V) SEARCH (S) SET (P) HELP (H)
Package Name (Now Play)
Content Name (Now Play)
Remain / Total : --0:00/999:59
Shuffle Repeat All
Recordar
EMD
Portable Player
Edit
My Select
Original
My Select
Filter
Now Sel Pack
Time
NUMBER OF POSSIBLE CHECKOUTS
Date
Memo
Package Name
Artist Name
No.
Content Name
Time
FIRST A. TARO
SECOND A. TARO
THIRD A. TARO
BEST TARO & JIRO
ASYNCHRONIZED KUWAI
1 HEAT 6:30 99/1/15
2 PLANET 4:44 99/1/15
3 BLACK 5:41 99/1/15
4 SOUL 4:15 99/1/15
5 FALL 3:45 99/1/15
6 DESTITUTE... 5:40 99/1/13
7 SONIC 5:15 99/1/15
8 BUTTERFLY(1) 1:55 99/1/15
9 BUTTERFLY(2) 2:33 99/1/15
10 WHERE DO WE... 5:13 99/1/15
11 A DAY 3:41 99/1/15
12 FUNKY 5:35 99/1/15
341
342
343
344
345
346
347
348
349
351
352

FIG.45

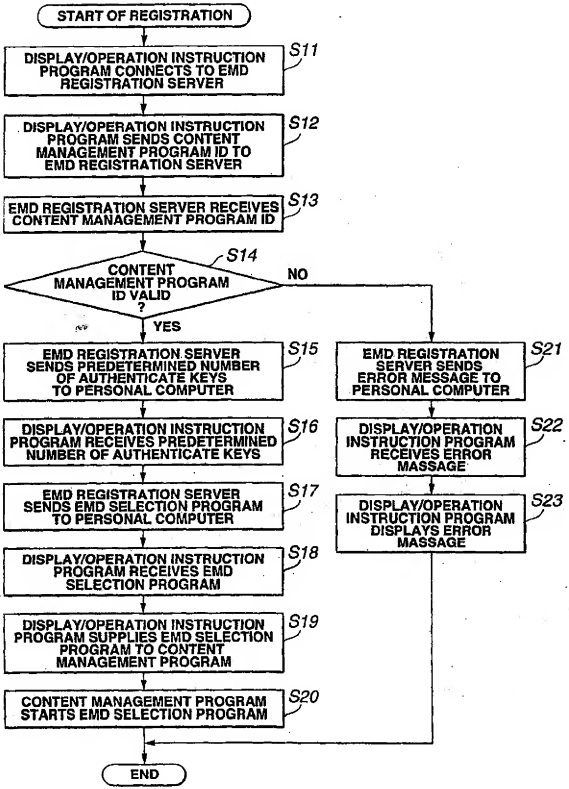
START OF REGISTRATION
DISPLAY/OPERATION INSTRUCTION PROGRAM CONNECTS TO EMD REGISTRATION SERVER
S11
DISPLAY/OPERATION INSTRUCTION PROGRAM SENDS CONTENT MANAGEMENT PROGRAM ID TO EMD REGISTRATION SERVER
S12
EMD REGISTRATION SERVER RECEIVES CONTENT MANAGEMENT PROGRAM ID
S13
CONTENT MANAGEMENT PROGRAM ID VALID ?
S14
NO
YES
EMD REGISTRATION SERVER SENDS PREDETERMINED NUMBER OF AUTHENTICATE KEYS TO PERSONAL COMPUTER
S15
DISPLAY/OPERATION INSTRUCTION PROGRAM RECEIVES PREDETERMINED NUMBER OF AUTHENTICATE KEYS
S16
EMD REGISTRATION SERVER SENDS EMD SELECTION PROGRAM TO PERSONAL COMPUTER
S17
DISPLAY/OPERATION INSTRUCTION PROGRAM RECEIVES EMD SELECTION PROGRAM
S18
DISPLAY/OPERATION INSTRUCTION PROGRAM SUPPLIES EMD SELECTION PROGRAM TO CONTENT MANAGEMENT PROGRAM
S19
CONTENT MANAGEMENT PROGRAM STARTS EMD SELECTION PROGRAM
S20
EMD REGISTRATION SERVER SENDS ERROR MESSAGE TO PERSONAL COMPUTER
S21
DISPLAY/OPERATION INSTRUCTION PROGRAM RECEIVES ERROR MASSAGE
S22
DISPLAY/OPERATION INSTRUCTION PROGRAM DISPLAYS ERROR MASSAGE
S23
END

FIG.46

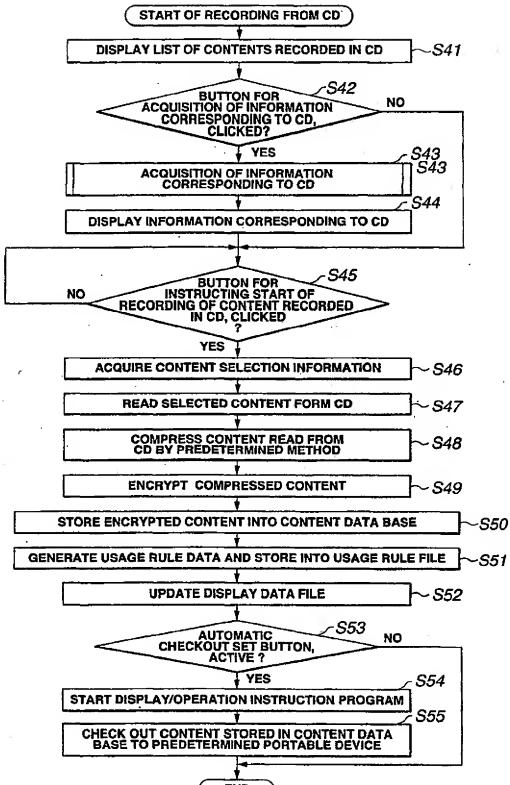
START OF RECORDING FROM CD
DISPLAY LIST OF CONTENTS RECORDED IN CD
S41
BUTTON FOR ACQUISITION OF INFORMATION CORRESPONDING TO CD, CLICKED?
S42
NO
YES
ACQUISITION OF INFORMATION CORRESPONDING TO CD
S43
DISPLAY INFORMATION CORRESPONDING TO CD
S44
BUTTON FOR INSTRUCTING START OF RECORDING OF CONTENT RECORDED IN CD, CLICKED ?
S45
NO
YES
ACQUIRE CONTENT SELECTION INFORMATION
S46
READ SELECTED CONTENT FORM CD
S47
COMPRESS CONTENT READ FROM CD BY PREDETERMINED METHOD
S48
ENCRYPT COMPRESSED CONTENT
S49
STORE ENCRYPTED CONTENT INTO CONTENT DATA BASE
S50
GENERATE USAGE RULE DATA AND STORE INTO USAGE RULE FILE
S51
UPDATE DISPLAY DATA FILE
S52
AUTOMATIC CHECKOUT SET BUTTON, ACTIVE ?
S53
NO
YES
START DISPLAY/OPERATION INSTRUCTION PROGRAM
S54
CHECK OUT CONTENT STORED IN CONTENT DATA BASE TO PREDETERMINED PORTABLE DEVICE
S55
END

FIG.47

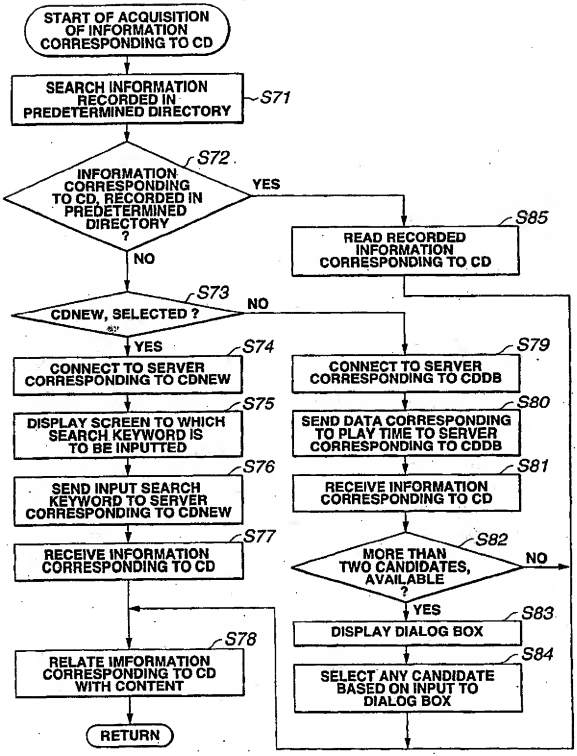
START OF ACQUISITION OF INFORMATION CORRESPONDING TO CD
SEARCH INFORMATION RECORDED IN PREDETERMINED DIRECTORY
S71
INFORMATION CORRESPONDING TO CD, RECORDED IN PREDETERMINED DIRECTORY ?
S72
YES
NO
READ RECORDED INFORMATION CORRESPONDING TO CD
S85
CDNEW, SELECTED ?
S73
NO
YES
CONNECT TO SERVER CORRESPONDING TO CDNEW
S74
DISPLAY SCREEN TO WHICH SEARCH KEYWORD IS TO BE INPUTTED
S75
SEND INPUT SEARCH KEYWORD TO SERVER CORRESPONDING TO CDNEW
S76
RECEIVE INFORMATION CORRESPONDING TO CD
S77
RELATE IMFORMATION CORRESPONDING TO CD WITH CONTENT
S78
RETURN
CONNECT TO SERVER CORRESPONDING TO CDDB
S79
SEND DATA CORRESPONDING TO PLAY TIME TO SERVER CORRESPONDING TO CDDB
S80
RECEIVE INFORMATION CORRESPONDING TO CD
S81
MORE THAN TWO CANDIDATES, AVAILABLE ?
S82
NO
YES
DISPLAY DIALOG BOX
S83
SELECT ANY CANDIDATE BASED ON INPUT TO DIALOG BOX
S84

FIG.48

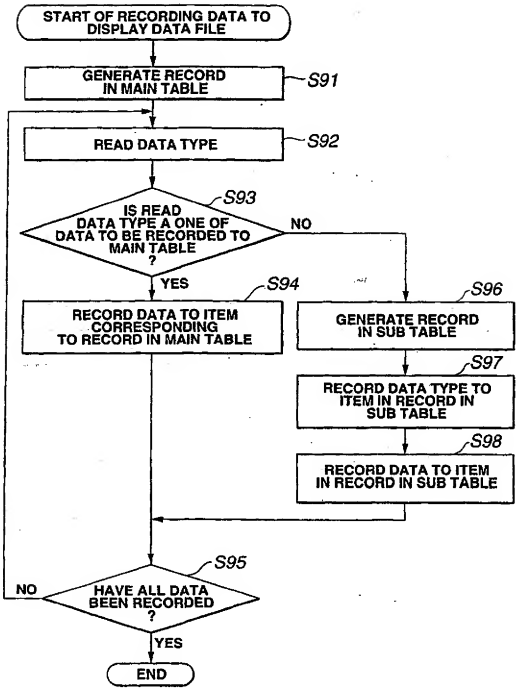
START OF RECORDING DATA TO DISPLAY DATA FILE
GENERATE RECORD IN MAIN TABLE
S91
READ DATA TYPE
S92
S93
IS READ DATA TYPE A ONE OF DATA TO BE RECORDED TO MAIN TABLE ?
NO
YES
S94
RECORD DATA TO ITEM CORRESPONDING TO RECORD IN MAIN TABLE
S96
GENERATE RECORD IN SUB TABLE
S97
RECORD DATA TYPE TO ITEM IN RECORD IN SUB TABLE
S98
RECORD DATA TO ITEM IN RECORD IN SUB TABLE
S95
NO
HAVE ALL DATA BEEN RECORDED ?
YES
END

FIG.49

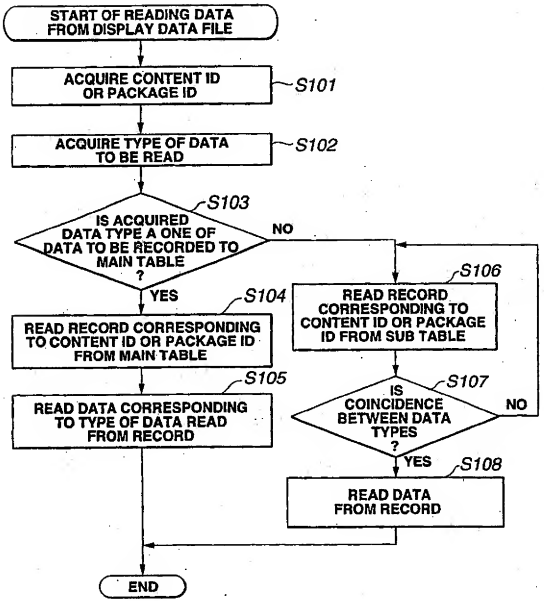
START OF READING DATA FROM DISPLAY DATA FILE
ACQUIRE CONTENT ID OR PACKAGE ID
S101
ACQUIRE TYPE OF DATA TO BE READ
S102
S103
IS ACQUIRED DATA TYPE A ONE OF DATA TO BE RECORDED TO MAIN TABLE ?
NO
YES
S104
READ RECORD CORRESPONDING TO CONTENT ID OR PACKAGE ID FROM MAIN TABLE
S105
READ DATA CORRESPONDING TO TYPE OF DATA READ FROM RECORD
S106
READ RECORD CORRESPONDING TO CONTENT ID OR PACKAGE ID FROM SUB TABLE
S107
IS COINCIDENCE BETWEEN DATA TYPES ?
NO
YES
S108
READ DATA FROM RECORD
END

FIG.50

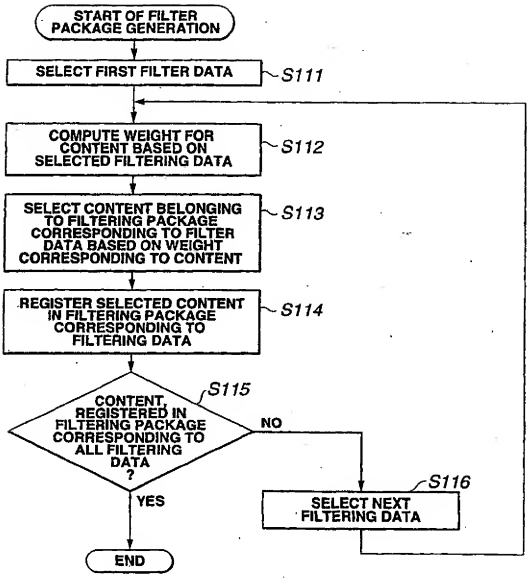
START OF FILTER PACKAGE GENERATION
SELECT FIRST FILTER DATA
S111
COMPUTE WEIGHT FOR CONTENT BASED ON SELECTED FILTERING DATA
S112
SELECT CONTENT BELONGING TO FILTERING PACKAGE CORRESPONDING TO FILTER DATA BASED ON WEIGHT CORRESPONDING TO CONTENT
S113
REGISTER SELECTED CONTENT IN FILTERING PACKAGE CORRESPONDING TO FILTERING DATA
S114
CONTENT REGISTERED IN FILTERING PACKAGE CORRESPONDING TO ALL FILTERING DATA ?
S115
NO
YES
SELECT NEXT FILTERING DATA
S116
END

FIG.51

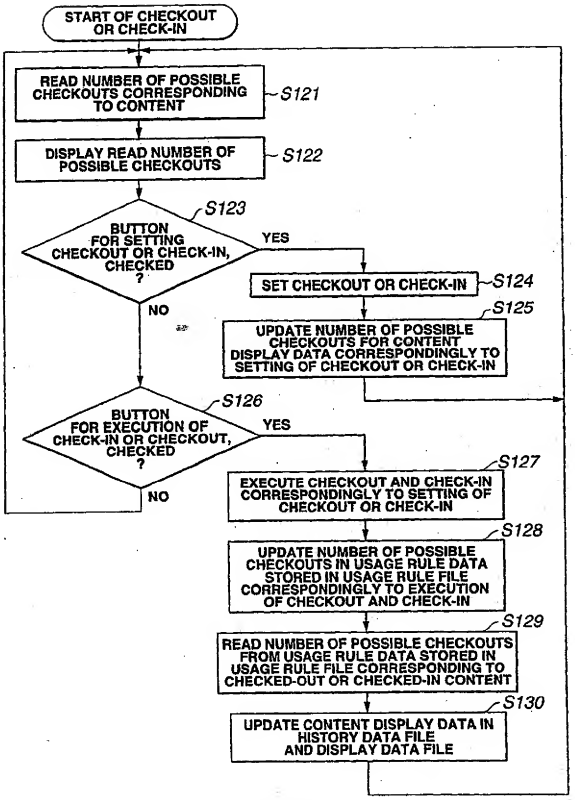
START OF CHECKOUT OR CHECK-IN
READ NUMBER OF POSSIBLE CHECKOUTS CORRESPONDING TO CONTENT
S121
DISPLAY READ NUMBER OF POSSIBLE CHECKOUTS
S122
S123
BUTTON FOR SETTING CHECKOUT OR CHECK-IN, CHECKED ?
YES
NO
SET CHECKOUT OR CHECK-IN
S124
S125
UPDATE NUMBER OF POSSIBLE CHECKOUTS FOR CONTENT DISPLAY DATA CORRESPONDINGLY TO SETTING OF CHECKOUT OR CHECK-IN
S126
BUTTON FOR EXECUTION OF CHECK-IN OR CHECKOUT, CHECKED ?
YES
NO
S127
EXECUTE CHECKOUT AND CHECK-IN CORRESPONDINGLY TO SETTING OF CHECKOUT OR CHECK-IN
S128
UPDATE NUMBER OF POSSIBLE CHECKOUTS IN USAGE RULE DATA STORED IN USAGE RULE FILE CORRESPONDINGLY TO EXECUTION OF CHECKOUT AND CHECK-IN
S129
READ NUMBER OF POSSIBLE CHECKOUTS FROM USAGE RULE DATA STORED IN USAGE RULE FILE CORRESPONDING TO CHECKED-OUT OR CHECKED-IN CONTENT
S130
UPDATE CONTENT DISPLAY DATA IN HISTORY DATA FILE AND DISPLAY DATA FILE

FIG.52

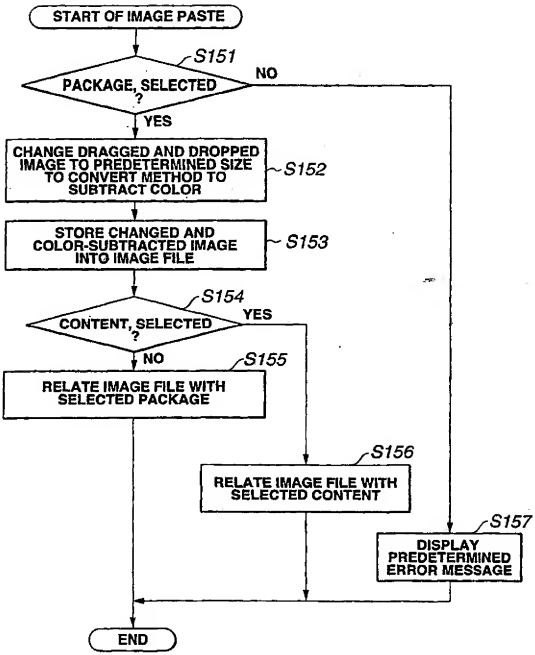
START OF IMAGE PASTE
S151
PACKAGE, SELECTED ?
NO
YES
CHANGE DRAGGED AND DROPPED IMAGE TO PREDETERMINED SIZE TO CONVERT METHOD TO SUBTRACT COLOR
S152
STORE CHANGED AND COLOR-SUBTRACTED IMAGE INTO IMAGE FILE
S153
S154
CONTENT, SELECTED ?
YES
NO
S155
RELATE IMAGE FILE WITH SELECTED PACKAGE
S156
RELATE IMAGE FILE WITH SELECTED CONTENT
S157
DISPLAY PREDETERMINED ERROR MESSAGE
END

FIG.53

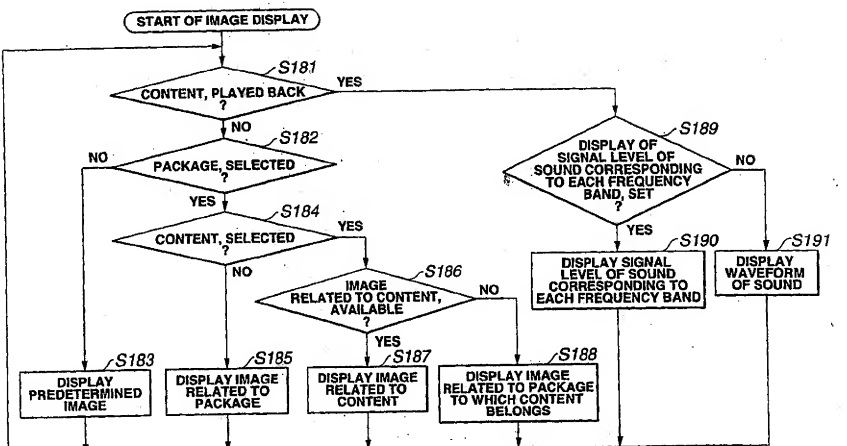

FIG.54

EP 1 154 404 A1

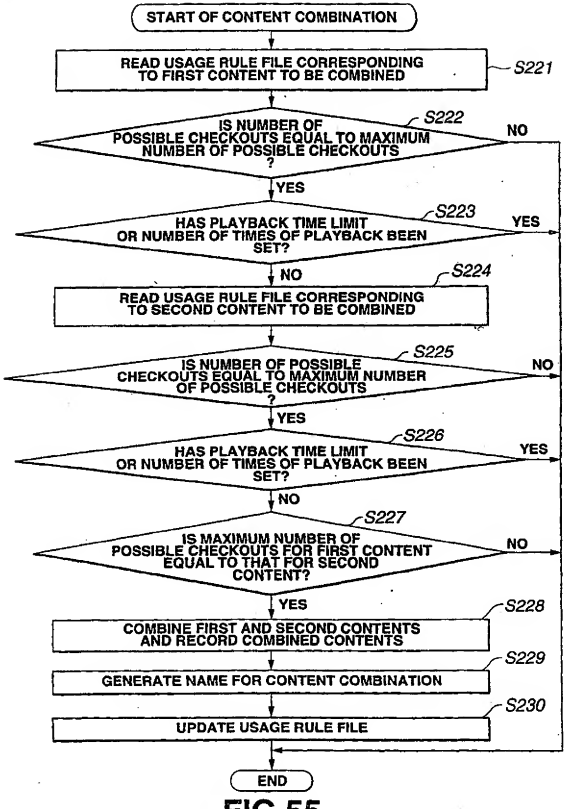
START OF CONTENT COMBINATION
READ USAGE RULE FILE CORRESPONDING TO FIRST CONTENT TO BE COMBINED
S221
IS NUMBER OF POSSIBLE CHECKOUTS EQUAL TO MAXIMUM NUMBER OF POSSIBLE CHECKOUTS ?
S222
NO
YES
HAS PLAYBACK TIME LIMIT OR NUMBER OF TIMES OF PLAYBACK BEEN SET?
S223
YES
NO
READ USAGE RULE FILE CORRESPONDING TO SECOND CONTENT TO BE COMBINED
S224
IS NUMBER OF POSSIBLE CHECKOUTS EQUAL TO MAXIMUM NUMBER OF POSSIBLE CHECKOUTS ?
S225
NO
YES
HAS PLAYBACK TIME LIMIT OR NUMBER OF TIMES OF PLAYBACK BEEN SET?
S226
YES
NO
IS MAXIMUM NUMBER OF POSSIBLE CHECKOUTS FOR FIRST CONTENT EQUAL TO THAT FOR SECOND CONTENT?
S227
NO
YES
COMBINE FIRST AND SECOND CONTENTS AND RECORD COMBINED CONTENTS
S228
GENERATE NAME FOR CONTENT COMBINATION
S229
UPDATE USAGE RULE FILE
S230
END

FIG.55

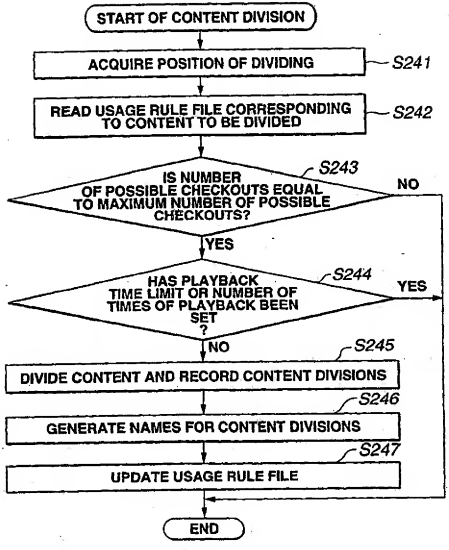
START OF CONTENT DIVISION
ACQUIRE POSITION OF DIVIDING
S241
READ USAGE RULE FILE CORRESPONDING TO CONTENT TO BE DIVIDED
S242
IS NUMBER OF POSSIBLE CHECKOUTS EQUAL TO MAXIMUM NUMBER OF POSSIBLE CHECKOUTS?
S243
NO
YES
HAS PLAYBACK TIME LIMIT OR NUMBER OF TIMES OF PLAYBACK BEEN SET ?
S244
YES
NO
DIVIDE CONTENT AND RECORD CONTENT DIVISIONS
S245
GENERATE NAMES FOR CONTENT DIVISIONS
S246
UPDATE USAGE RULE FILE
S247
END

FIG.56

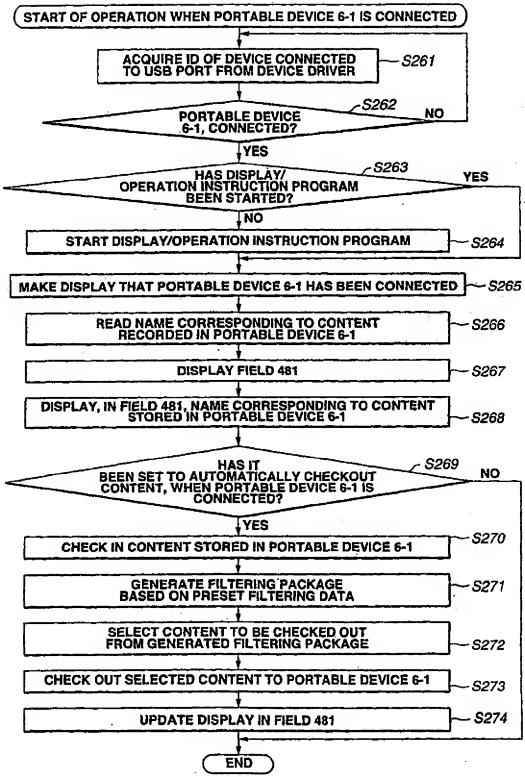
START OF OPERATION WHEN PORTABLE DEVICE 6-1 IS CONNECTED
ACQUIRE ID OF DEVICE CONNECTED TO USB PORT FROM DEVICE DRIVER
S261
PORTABLE DEVICE 6-1, CONNECTED?
S262
NO
YES
HAS DISPLAY/ OPERATION INSTRUCTION PROGRAM BEEN STARTED?
S263
YES
NO
START DISPLAY/OPERATION INSTRUCTION PROGRAM
S264
MAKE DISPLAY THAT PORTABLE DEVICE 6-1 HAS BEEN CONNECTED
S265
READ NAME CORRESPONDING TO CONTENT RECORDED IN PORTABLE DEVICE 6-1
S266
DISPLAY FIELD 481
S267
DISPLAY, IN FIELD 481, NAME CORRESPONDING TO CONTENT STORED IN PORTABLE DEVICE 6-1
S268
HAS IT BEEN SET TO AUTOMATICALLY CHECKOUT CONTENT, WHEN PORTABLE DEVICE 6-1 IS CONNECTED?
S269
NO
YES
CHECK IN CONTENT STORED IN PORTABLE DEVICE 6-1
S270
GENERATE FILTERING PACKAGE BASED ON PRESET FILTERING DATA
S271
SELECT CONTENT TO BE CHECKED OUT FROM GENERATED FILTERING PACKAGE
S272
CHECK OUT SELECTED CONTENT TO PORTABLE DEVICE 6-1
S273
UPDATE DISPLAY IN FIELD 481
S274
END

FIG.57

INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP00/08915

A. CLASSIFICATION OF SUBJECT MATTER
Int.Cl[7] G10K15/02, G06F12/00, 12/14, 17/30

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
Int.Cl[7] G10K15/02, G10L19/00, G06F12/00, 17/30

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Jitsuyo Shinan Koho 1922-1996 Toroku Jitsuyo Shinan Koho 1994-2001
Kokai Jitsuyo Shinan Koho 1971-2001 Jitsuyo Shinan Toroku Koho 1996-2001

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
JICST FILE(JOIS),INSPEC(DIALOG),WPI(DIALOG),
IEEE Electronic Library Online.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	"Kogata Memory Card de Ongaku Chosakuken wo mamoru," Nikkei Electronics, Vol.739, 22 March, 1999 (22.03.99), pp.49-53	1-8
A	"Ongaku Haishin matta nashi," Nikkei Electronics, Vol.738, 08 March, 1999 (08.03.99), pp.87-111	1-8
A	WO, 99/54870, A1 (Sony Corporation), 28 October, 1999 (28.10.99), Full text, all drawings & JP, 11-306057, A	1-8
A	EP, 467208, B1 (Hitachi Ltd), 20 September, 1995 (20.09.95), Full text, all drawings & JP, 4-271396, A & EP, 658863, A2	1-8
A	Noriko SAKAI et al., "A Grammatical Method for Transformation of Document Structure in SGML", Technical research report of Information Processing Society of Japan(IPSJ), IPSJ Sig Notes, Vol.94, No.37, 94-FI-33-5,	1-8

☒ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
19 February, 2001 (19.02.01)	27 February, 2001 (27.02.01)
Name and mailing address of the ISA/ Japanese Patent Office	Authorized officer
Facsimile No.	Telephone No.

Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP00/08915

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
	pp.23-28, issued on 18 May, 1994 (18.05.94)	

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(74) Agents: JUDSON, David, H. et al.; Hughes & Luce, L.L.P., 1717 Main Street, Suite 2800, Dallas, TX 75201 (US).

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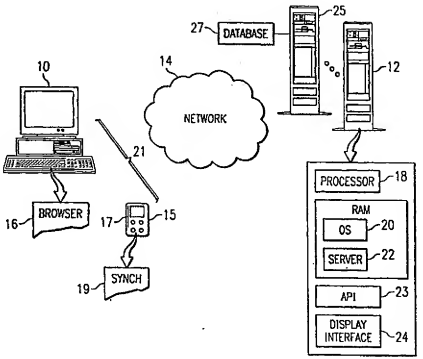
(54) Title: METHOD AND SYSTEM FOR ELECTRONIC DELIVERY OF COUPONS

(57) Abstract

An electronic coupon is obtained when a user selects a given link in a Web page on a client machine (10). The link is an image link embedded in an advertising banner on the Web page such that user click-through on the banner to generate the coupon. The coupon is then saved to a file on the client machine (10). Thereafter, the coupon is downloaded to a PDA via a communication link when the PDA is synchronized (19) to the desktop. When the coupon is downloaded to the PDA, it is saved in a coupon file. Contact information associated with the coupon provider is written to the PDA contact file. Moreover, the coupon's expiration date is stored in PDA's calendar, together with information for generating redemption remainders that are issued to the PDA user when the device is powered on. When the user desires to redeem the coupon, he or she may take the PDA to a terminal located at a retail establishment. By synchronizing the PDA to the terminal, the coupon is redeemed in exchange for a discount on a given product or service.



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METHOD AND SYSTEM FOR ELECTRONIC DELIVERY OF COUPONS

BACKGROUND OF THE INVENTION

Technical Field

The present invention relates generally to product and service merchandising through distribution of electronic coupons, gift certificates and the like.

Description of the Related Art

Recently, the computer industry has sought to add computer processing and communications capabilities to devices other than what would normally be considered a traditional computer. Such devices include, for example, personal digital assistants (PDAs), business organizers, watches, PCMCIA-based credit card organizers, and other handheld or "palm" devices. These devices typically include technology and software (e.g., 3Com HotSync®) to enable the user to synchronize data between the device and desktop software or another personal information manager (PIM) such as Microsoft Outlook. To synchronize data, the PDA is connected to a desktop either directly (e.g., by placing the PDA in a cradle that is connected to the desktop) or indirectly via an infrared link, a modem or a network. Once the connection is established, information or data located in the desktop computer may be communicated and stored in the PDA.

It is known in the art to display product or service coupons on pages that are available through the Internet's World Wide Web information retrieval system. A user of a computer may access those pages through use of a conventional Web browser. The user navigates to a given page, which is then saved to a file or printed. The hard copy of the coupon may then be carried by the user directly to a retail location and used to receive a discount on a given purchase.

It would be desirable to provide improved methods and systems for electronic delivery and use of coupons (namely, discount coupons, gift certificates, redeemable vouchers and the like) that could take advantage of the existing state-of-the-art of Internet and PDA technology.

BRIEF SUMMARY OF THE INVENTION

According to one embodiment of the present invention, an electronic or "virtual" coupon is obtained when a user selects a given link in a Web page being displayed on a client machine. Preferably, the link is an image link embedded on a Web site and/or in an advertising banner that is displayed on the Web page such that user click-through on the banner automatically generates the virtual coupon. The virtual coupon is then saved to a file on the client machine. Thereafter, the virtual coupon is downloaded to a PDA via a communication link when the PDA is synchronized to the desktop. When the virtual coupon is downloaded to the PDA, it is automatically saved in a coupon file. In addition, contact information associated with the coupon provider (e.g., address, web site URL, map and e-mail information) is automatically written to the PDA contact file. Moreover, the coupon's expiration date is stored in PDA's calendar, together with information for generating one or more redemption remainders that are periodically issued to the PDA user when the device is powered on. When the user desires to redeem the coupon, he or she may take the PDA to a terminal located at a retail establishment. By synchronizing the PDA to the terminal, the virtual coupon is redeemed in exchange for a discount on a given product or service. Alternatively, the coupon may be redeemed for an online purchase by connecting the PDA to a Web site, e.g., using a wireless connection.

According to another embodiment of the invention, a user of a PDA having a wireless Internet connection may navigate to a Web site and select a link (e.g., a link in an advertising banner) and receive the virtual coupon directly.

According to the invention, a central web site may be used to manage the distribution of the virtual coupons. In particular, an advertiser that desires to issue virtual discounts may register its coupons with the web site, perhaps for a given fee. Later, when users click through banner advertisements that include links to the web site, the users are seamlessly redirected to the site, which records the transactions and issues the virtual coupons. The site maintains a database of users who have downloaded virtual coupons, and

such information is also available for collateral promotional activities relating to the service.

Alternatively, a given advertiser (e.g., a retail department store) may offer the virtual coupons from its own site. In this case, the user navigates to the advertiser's site and selects the virtual coupon, which is then downloaded to the PDA (either through the user's PC-PDA link) or to the PDA directly as previously described.

The foregoing has outlined some of the more pertinent objects and features of the present invention. These objects should be construed to be merely illustrative of some of the more prominent features and applications of the invention. Many other beneficial results can be obtained by applying the disclosed invention in a different manner or modifying the invention as will be described. Accordingly, other objects and a fuller understanding of the invention may be had by referring to the following Detailed Description of the Preferred Embodiment.

BRIEF DESCRIPTION OF THE DRAWINGS

For a more complete understanding of the present invention and the advantages thereof, reference should be made to the following Detailed Description taken in connection with the accompanying drawings in which:

Figure 1 is a representative Internet operating environment in which the present invention may be implemented;

Figure 2 illustrates the transfer of the virtual coupon from the user's desktop computer to his or her PDA;

Figure 3 is a representative data file comprising a virtual coupon; and

Figure 4 is an alternative embodiment of the invention wherein a user of a PDA downloads a coupon directly from a server.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

A known Internet client-server system is implemented is illustrated in **Figure 1**. A client machine **10** is connected to a

Web server **12** via network **14**. For illustrative purposes, network **14** is the Internet, an intranet, an extranet or any other known network. Web server **12** is one of a plurality of servers which are accessible by clients, one of which is illustrated by machine **10**. A representative client machine includes a browser **16**, which is a known software tool used to access the servers of the network. The web server supports files (collectively referred to as a web site) in the form of hypertext documents and objects. In the Internet paradigm, a network path to a server is identified by a so-called Uniform Resource Locator (URL).

A representative web server **12** is an IBM Netfinity server comprising a RISC-based processor **18**, the AIX® operating system **20** and a web server program **22**, such as Netscape Enterprise Server. The server **12** also includes a display **24** supporting a graphical user interface (GUI) for management and administration, and an Application Programming Interface (API) **23** that provides extensions to enable application developers to extend and/or customize the core functionality thereof through software programs including Common Gateway Interface (CGI) programs, plug-ins, servlets, active server pages, server side include (SSI) functions or the like.

A representative Web client is a personal computer that is x86-, PowerPC®- or RISC-based, that includes an operating system such as IBM® OS/2® or Microsoft Windows '95, and that includes a Web browser, such as Netscape Navigator 4.0 (or higher), having a Java Virtual Machine (JVM) and support for application plug-ins or helper applications.

Also illustrated in **Figure 1** is a representative handheld computing client device **15** such as a personal digital assistant or PDA. The device typically includes a handheld stylus **17** for inputting information to the device. A representative device is marketed by Palm Computing, Inc., a 3Com Company, under the Palm V™ Organizer trademark. PDA **15** also includes synchronization

software **19** that interfaces with an associated routine supported in the desktop computer to facilitate synchronization of data between the desktop and the PDA over a communications link **21** (e.g., an infrared, serial or wireless connection).

Representative PDA devices include a x86-, PowerPC®- or RISC-based processor, a realtime operating system such as WindRiver VXWorks™, QSSL QNXNeutrino™, PalmOS, or Microsoft Windows CE, a Web browser or other graphics viewer, device drivers, control software, and a modem. These devices also include non-volatile memory, as well as system memory (namely, RAM).

While PDA is illustrated as a handheld organizer, any type of portable computing device can be used. These include, without limitation, business organizers, PCMCIA-based organizers, smart watches, Internet appliances, and other such devices.

A client machine and the PDA implementing the inventive protocol described below includes appropriate software for requesting and/or responding to given messages, and for extracting the data of interest. Such software is executable in a processor, namely, as a set of instructions (program code) in a code module resident in the random access memory of the computer. Until required by the computer, the set of instructions may be stored in another computer memory, for example, in a hard disk drive, or in a removable memory, or downloaded via the Internet or other computer network.

As also illustrated in **Figure 1**, one of the servers in the network may be a central or clearinghouse server **25** (which may be a group of such servers). This site includes a database **27** for supporting a set of virtual coupons available for download to client machines according to the invention. A given virtual coupon **40**, as illustrated in **Figure 3**, may comprise a data file of information including, without limitation, a discount offer **42**, contact information **44** (e.g., e-mail address, customer service or other telephone numbers), an expiration date **46**, reminder data **48** for generating redemption reminders, retail

location information **50**, a map **52**, a hyperlink **54** to the provider's web site, and other such useful information. Providers of virtual coupons preferably store those coupons in the database. The operator of the server **25** may provide the virtual coupon distribution service for a fee. The virtual coupons are served with web pages in a conventional manner. In particular, given web sites contract with the server **25** to access the stored virtual coupons. When those web sites are later accessed by users with client machines, the virtual coupons are selectively served, e.g., as banner advertisements with embedded links to the web server **25**.

Returning now back to **Figure 1**, it is now assumed that a web page displaying a banner advertisement (or other clickable graphic or text) having an associated virtual coupon link is being rendered on a client machine. When the user of that machine selects the advertisement, the client's browser is redirected to the server **25**, which then serves the virtual coupon back to the client. At this point, a pop-up window or other announcement (e.g., an e-mail) may be provided to the user at the client machine indicating that the virtual coupon offer has been delivered. The virtual coupon and, in particular, the data file, is then stored in the client machine. Preferably, the virtual coupon file is maintained in a non-volatile storage area of the client (e.g., the hard disk).

Referring now to **Figure 2**, when the user later synchronizes his or her PDA device to the client, the virtual coupon is automatically downloaded to the PDA. Preferably, the virtual coupon is stored in the memo or notepad section of the PDA (or, alternatively, in a specific PDA coupon organizer), the contact information is automatically supplied to the PDA contact file, and the expiration date information is automatically supplied to the PDA calendaring system. If the PDA has graphics capability (e.g., a browser or rendering engine), the map data may be stored for subsequent recall and display. In addition, the redemption reminder data is provided to the PDA calendar to

facilitate display of periodic reminders to the user. Thus, for example, when the user powers on the PDA on a given day tagged for a reminder, a message (e.g., "you have 2 days left to redeem your American Airlines travel voucher) is posted to the PDA display. Preferably, expired coupons are automically deleted from storage, although the contact information is preferably maintained for future use.

As one of ordinary skill will readily appreciate, the present invention offers numerous advantages. With the inventive technique, the consumer is able to "clip" coupons on the web and organize them in a PDA or other portable computing device. In particular, given virtual coupons may be readily organized into different selectable groups (e.g., food, entertainment, travel, retail, etc.) for ease of retrieval and use. The user need no longer worry about locating and carrying the actual paper.

When incorporated within a web page or other application, such as a web calendar, users click through a licensed advertising banner and seamlessly transfer a virtual coupon to a PDA that is ready for redemption. Thus, for example, if a user is already registered with and a user of a web calendar, the user synchronizes his client PIM with his personal web calendar, and the user uses a PDA, the user may click through a virtual coupon banner and transfer the coupon to the PDA directly.

For the advertiser, the present invention provides another distribution mechanism for coupons. The virtual coupon affords advertisers the ability to target their advertisements and reduce costs. Advertisers pay standard web advertising banner fees, but only pay one fee when the coupon is downloaded. Advertisers may share revenues if there is a sale. The inventive distribution technique is a value-added advertising banner that is convenient, accessible, private, and readily integrated into existing web and PDA technologies. As described above, the virtual coupon is not a paper coupon (although it could be) but, rather, is a true digital coupon obtainable on the Internet (or via an intranet or other computer network) by either clicking a banner advertisement or,

alternatively, navigating to a site that supports the virtual coupon functionality. As noted above, the banner advertisement offers the consumer a free coupon for the product the consumer wants, preferably by clicking the banner.

There are many variants of the above-described scheme. Thus, for example, the user may access the Internet directly with a PDA device, such as illustrated in **Figure 4**. In this example, the PDA **60** (e.g., a Palm VII device) has a wireless Internet connection over network **62** to the server **64** from which coupons are available. As noted above, server **64** may serve coupons directly, or it may cause such coupons to be served to the PDA by redirecting a request to another server **66** that actually serves the coupons. In either case, the coupons are served directly to the PDA, which then stores them as previously described. In this manner, the user is not required to first download the virtual coupons to his or her PC and then, later, transfer those coupons to the PDA through the infrared or other link.

As used herein, a "coupon" should be broadly construed to cover any offer that can be redeemed for some product, service, credit or the like. Thus, a coupon includes a gift certificate, a redeemable voucher, a percentage discount, a merchandise credit, and the like.

Although not illustrated in detail, it should be appreciated that appropriate security techniques may be used to ensure integrity of the coupon delivery mechanism of the present invention. Thus, for example, the coupon may be downloaded (either to the PC or the PDA) as an unalterable digital image or with a verifying code (e.g., a digital watermark, a checksum, or the like). This would prevent alteration of the coupon's expiration date, for example. If desired, the coupon may be downloaded from the network to the PC or PDA over a secure link (e.g., a secure sockets layer) or using an appropriate encryption scheme (e.g., PGP). Another desirable fraud prevention technique is to associate a given identifier (e.g., a coupon serial number) with a given user (or user identifier, such as a cookie). Thus, for example, the given identifier may be associated with the given user when the user first downloads

the coupon. When the user desires to redeem the virtual coupon, the coupon is first authenticated before it is honored. One technique for authenticating the coupon (or the user, as the case may be) is to have the redemption site send a message to a server that issued the coupon or that manages such validity checks.

Of course, virtual coupons may also be managed directly through a user's PC, instead of using the PDA. In this way, a user may navigate to a site (e.g., a Neiman-Marcus web site), select an item that generates a virtual coupon to the user's computer, and then later redeem that virtual coupon in a virtual manner (e.g., in an online manner).

Although the various methods described herein are conveniently implemented in a general purpose computer selectively activated or reconfigured by software, one of ordinary skill in the art would also recognize that such methods may be carried out in hardware, in firmware, or in more specialized apparatus constructed to perform the required method steps.

Further, as used herein, a "client" should be broadly construed to mean any computer or component thereof directly or indirectly connected or connectable in any known or later-developed manner to a computer network, such as the Internet. Of course, a "client" should be broadly construed to mean one who requests or gets the file, and "server" is the entity which downloads the file.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is set forth in the following claims.

CLAIMS

1. A method of distributing and using electronic coupons, comprising the steps of:

displaying on a client a Web page having a clickable graphic;

in response to selection of the clickable graphic, serving a digital file to the client, the digital file including a coupon offer and given contact information; at a later time, transferring the digital file from the client to a portable computing device;

storing the coupon offer and saving the given contact information in a contact database in the portable computing device.

2. The method as described in Claim 1 further including the step of redeeming the coupon offer at a retail establishment.

3. The method as described in Claim 1 wherein the digital file also includes other data transferred to the portable computing device.

4. The method as described in Claim 3 wherein the other data includes a map.

5. The method as described in Claim 3 wherein the other data includes a hyperlink to a provider's web site.

6. The method as described in Claim 3 wherein the other date includes reminder dates.

7. The method as described in Claim 6 wherein the reminder dates are used to generate reminder messages on the portable computing device.

8. The method as described in Claim 1 wherein the digital file is served from a server at which a plurality of digital files are maintained.

9. A method of distributing and using electronic coupons, comprising the steps of:

displaying on a portable digital assistant (PDA) information including a link;

in response to selection of the link, serving a digital file to the PDA, the digital file including a coupon offer, given contact information, and an expiration date;

storing the coupon offer and saving the given contact information in a contact database in the PDA; and

at a later time, but prior to the expiration date, redeeming the coupon offer.

10. The method as described in Claim 9 wherein the digital file includes an unalterable image of a coupon.

11. The method as described in Claim 9 wherein the digital file is served to the PDA over a secure link.

12. The method as described in Claim 9 wherein the coupon offer is associated with a given user identifier to prevent use of the coupon offer by a third party.

13. The method as described in Claim 12 wherein the given user identifier is a cookie.

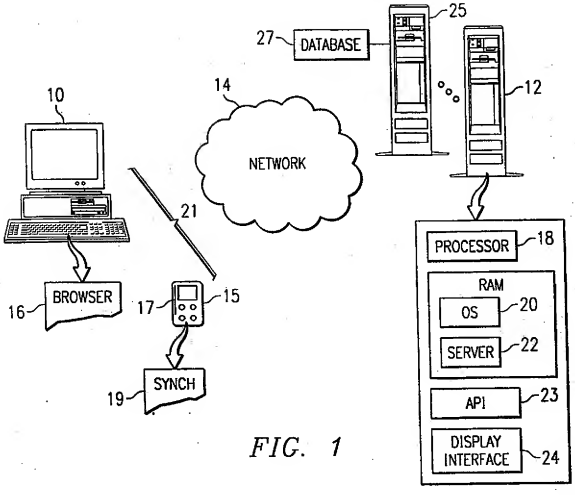
25
27
DATABASE
12
14
10
NETWORK
21
PROCESSOR
18
RAM
OS
20
SERVER
22
16
BROWSER
17
15
API
23
DISPLAY INTERFACE
24
19
SYNCH

FIG. 1

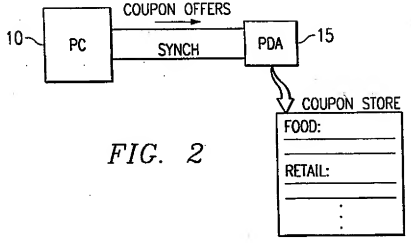
COUPON OFFERS
10
PC
SYNCH
PDA
15
COUPON STORE
FOOD:
RETAIL:

FIG. 2

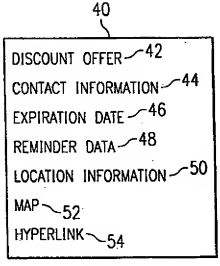
40
DISCOUNT OFFER 42
CONTACT INFORMATION 44
EXPIRATION DATE 46
REMINDER DATA 48
LOCATION INFORMATION 50
MAP 52
HYPERLINK 54

FIG. 3

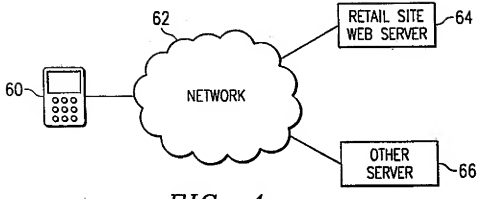
62
RETAIL SITE WEB SERVER
64
60
NETWORK
OTHER SERVER
66

FIG. 4

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US00/12955

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) :G06F 17/60
US CL :705/14

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 705/14, 1, 16, 26

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Please See Extra Sheet.

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

Please See Extra Sheet.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,806,044 A (POWELL) 08 September 1998, the background and the summary of the invention, fig.1A, col.4 lines 58-67, col.5 lines 6-21 and 32-50, col.6 lines 58-67, col.7 lines 7-30, col.7 line 64 to col.8 line 3, col.9 lines 54-65, col.12 line 61 to col.13 line 11.	1-13
Y,P	US 6,009,410 A (LEMOLE ET AL.) 28 December 1999, the abstract, background and the summary of the invention, col.3 lines 27-65.	1-13
Y,P	US 6,049,779 A (BERKSON) 11 April 2000, col..4 lines 25-43, col.11 lines 14-36.	1-13
Y	US 5,305,197 A (AXLER et al.) 19 April 1994, the background and the summary of the invention, col.2 lines 45-67.	1-13

[X] Further documents are listed in the continuation of Box C. [ ] See patent family annex.

*	Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E"	earlier document published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O"	document referring to an oral disclosure, use, exhibition or other means		
"P"	document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search	Date of mailing of the international search report
09 AUGUST 2000	23 AUG 2000
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231	Authorized officer CUONG H. NGUYEN
Facsimile No. (703) 305-3230	Telephone No. (703) 305-4553

Form PCT/ISA/210 (second sheet) (July 1998)*

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US00/12955

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,249,044 A (VON KOHORN) 28 September 1993, col.6 lines 23-45.	1-13
Y,P	US 6,026,369 A (CAPEK) 15 February 2000, the description of prior art.	1-13
Y,P	US 5,948,061 A (MERRIMAN et al.) 07 September 1999, col.3 line 64 to col.4 line 11, col.5 lines 10-48, col.7 lines 15-30, col.8 lines 61-67.	1-13
Y,P	US 5,992,888 A (NORTH et al.) 30 November 1999, col.9 lines 8-26.	1-13
Y	US 4,882,675 A (NICHTBERGER et al.) 21 November 1989, col.23 lines 3-10.	1-13
Y,P	US 5,970,469 A (SCROGGIE et al.) 19 October 1999, col.11 1-25.	1-13
Y	US 4,097,067 A (SCHECHTER) 27 June 1978, the background and the summary of the invention, col.1 lines 30-58, col.3 lines 6-23, col.6 lines 18-36.	1-13
Y	US 5,821,513 A (O'HAGAN et al.) 13 October 1998, col.11 lines 14-35.	1-13
A	US 5,734,823 A (SAIGH et al.) 31 March 1998, the background and the summary of the invention.	1-13
A	US 5,773,954 A (VANHORN) 30 June 1998, the background and the summary of the invention.	1-13
A	US 4,010,964 A (SCHECHTER) 08 March 1977, the summary.	1-13
Y	JP 407327094A (KURIHARA) 12 December 1995, the constitution of the invention.	1-13

International application No.
PCT/US00/12955

B. FIELDS SEARCHED
Documentation other than minimum documentation that are included in the fields searched:

DOWNES ET AL., BARRON'S DICTIONARY OF FINANCE AND INVESTMENT TERMS, 5TH EDITION, 1998.
HARCOURT: AP DICTIONARY OF SCIENCE AND TECHNOLOGY
MICROSOFT PRESS COMPUTER DICTIONARY, 3RD EDITION.

B. FIELDS SEARCHED
Electronic data bases consulted (Name of data base and where practicable terms used):

WEST2.0/DERWENT, DIALOG CLASSIC, NPL (PROQUEST DIRECT, CORPORATE RESOURCENET), ECOMMERCE-GUIDE.COM, ECOMMERCE WEBOPEDIA, ENCYCLOPEDIA BRITANNICA ONLINE.
search terms: distribute, coupon, redeem, graphic, display, client, Web, clickable, transfer, store, data, hyperlink, map, reminder, date, message, secure link, prevent, identifier, user, cookie, offer, PDA or portable digital assistant